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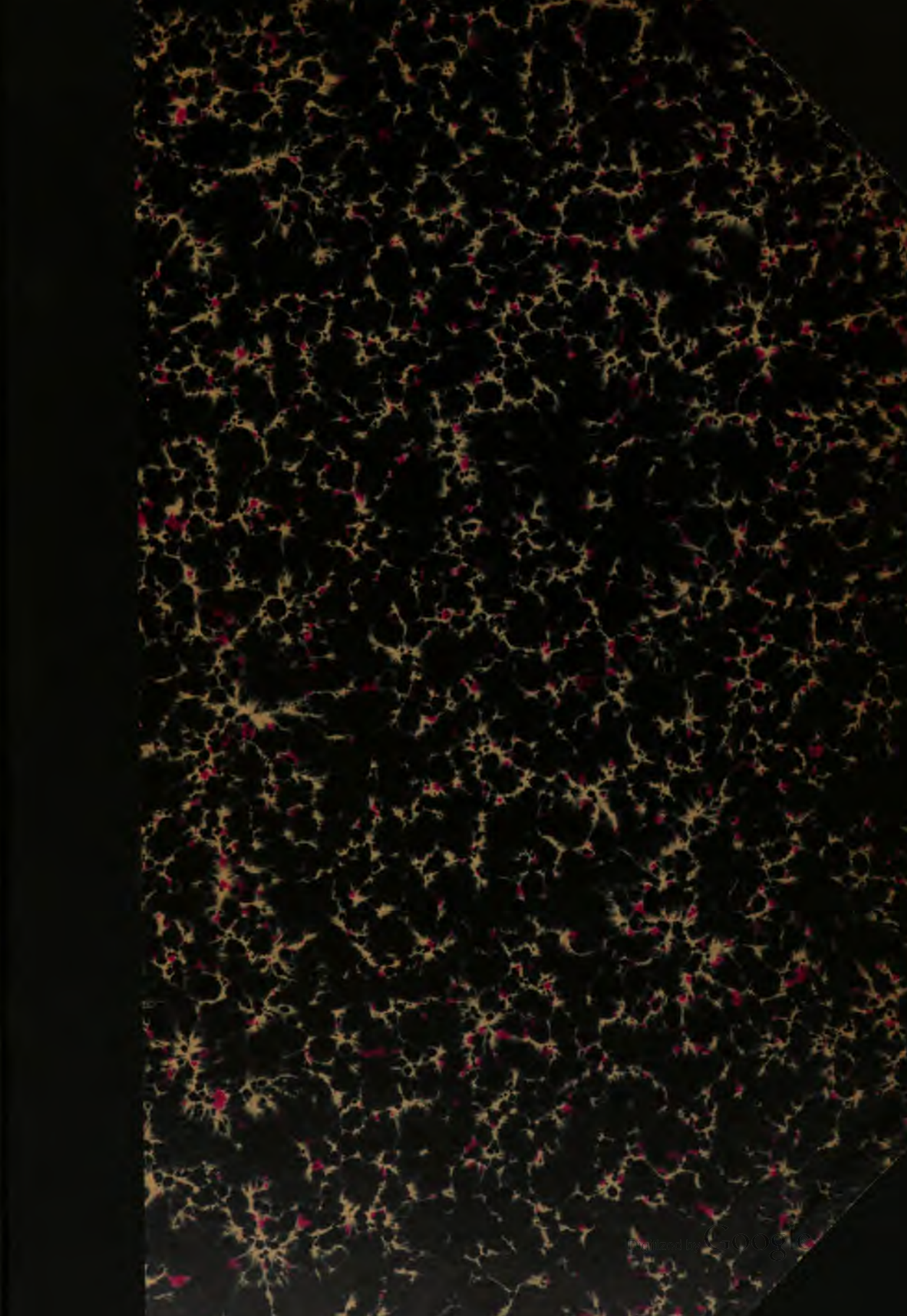

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PROCEEDINGS

OF THE

WASHINGTON ACADEMY OF SCIENCES

VOL. IV, PP. 293-372. PLS. XIII-XXIII. JULY 31, 1902.

PAPERS FROM THE HARRIMAN ALASKA EXPEDITION.

XXIX.

THE MOSSES OF ALASKA.

BY

J. CARDOT AND I. THÉRIOT.

WASHINGTON, D. C.

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THE MOSSES OF ALASKA.

BY J. CARDOT AND I. THÉRIOT.

INTRODUCTION.

THE following catalogue of the mosses of Alaska and some adjacent islands is based primarily upon the collection made by the Harriman Expedition in 1899. For completeness, however, species previously reported from the region are also included.

The whole number here enumerated is 280, of which 124 are new to Alaska and 46 are new to science. The 29 new species and 17 new varieties, except for three species of *Bryum*, are here first described.

The mosses brought back by the Harriman Expedition were collected by Wm. H. Brewer, W. R. Coe, L. J. Cole, F. V. Coville, T. H. Kearney, De Alton Saunders and Wm. Trelease.

Previous collections were made by W. H. Dall, 1867; Krause brothers, 1882; W. G. Wright, 1891; Jas. M. Macoun, 1891–92; B. W. Evermann, 1892; C. H. Townsend, 1893–95 (Exp. of U. S. S. *Albatross*); W. M. Canby, 1897; W. H. Evans, 1897; W. A. Setchell, 1899; F. C. Schrader, 1899.

Ins Harriman Exped. 4o. 253-328, pl. 30-40

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Subclass **ANDREÆALES.**

Family ANDREÆACEÆ.

Andreæa petrophila Ehrh. in Hann. Mag., 1784, p. 140, and in Beitr 1, p. 192.

From Orca (Trelease, 2245), Hall Island (Trelease, 2127), St. Matthew Island (Trelease, 2168, 2530). New to Alaska.

Andreæa petrophila sylvicola Bryol. eur., VI, p. 13, pl. 2, e.

From Hall Island (Trelease, 2527). New to Alaska.

Andreæa parvifolia C. Müll. in Flora, 1887, p. 219.

From upper part of Dyea valley (Krause brothers).

Andreæa papillosa Lindb. in Oefv. af Vet. Ak. Forh., XXIII, p. 557.

From St. Lawrence Bay, and Plover Bay, Siberia (W. H. Dall).

Subclass **BRYALES.**

Family WEISIACEÆ.

Gymnostomum curvirostre scabrum Lindb. Musc. scand., p. 22.

From Port Wells (Trelease, 1834). New to Alaska.

Anœctangium compactum Schw. Suppl. I, 1, p. 36, pl. XI.

From White Pass, 1,900 feet (Trelease, 2309); Orca (Trelease, 2259, 2260 in part).

ANŒCTANGIUM COMPACTUM ALASKANUM var. nov.

Habitu robustiore, foliis madore magis patulis, longioribus latioribusque, cellulis majoribus (mediis 6–9 μ latis, loco 4–6) reteque magis opaco distinctum.

From Port Wells (Trelease, 1832).

Dicranoweisia crispula Lindb. in Oefv. af Vet. Ak. Forh., 1864, p. 230.

From White Pass, 3,000 feet (Trelease, 2492); Port Clarence (Trelease, 2119); Hall Island (Trelease, 2129, 2131, 2134); St. Matthew Island (Trelease, 2153, 2154); Attu Island (J. M. Macoun).

Most of these specimens have the inner perichætial bracts shortly acuminate, which relates them to *D. contermina* Ren. & Card. (*D. roellii* Kindb.), but the alar cells are usually more distinct than on the moss from Oregon and Idaho. Moreover, the comparison with numerous specimens from different regions of Europe and North America proves that the characters on which *D. contermina* has been established

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are too variable and insufficient to establish a specific distinction. *D. contermina* must therefore be considered as only a variety of *D. crispula*, and the specimens from Alaska and the islands of Bering Sea are nearly all intermediate between the type and this variety.

D. obliqua Kindb., which has been recorded from Alaska, is unknown to us; but, from the description, it is probable that it, likewise, is only a form of *D. crispula*. (Cfr. Kindberg, Notes on Canadian Bryology, 1893, and Eur. and N. Amer. Bryineæ, p. 210.)

Rhabdoweisia fugax Br. eur., fasc. 33–36, p. 4, pl. 41.

From Kodiak (Trelease, 2217, 2218). New to Alaska.

Rhabdoweisia fugax subdenticulata Boul. Musc. de la France, p. 543.

From Juneau (Brewer and Coe, 699*a*). New to Alaska.

Another species of Weisiaceæ, *Oreoweisia serrulata* Sch., has been recorded from Nulato by J. T. Rothrock and by Lesquereux and James (Manual, p. 58).

Family DICRANACEÆ.

Cynodontium torquescens Limpr. Laubm., I, p. 288.

From Port Clarence (Trelease, 2101, 2102, 2525).

Number 2101 has the peristome smooth or nearly so; it is *C. subalpestre* Kindb. in Mac. Cat. Can. pl., VI, Musci, pp. 17 and 257.

CYNODONTIUM TRELEASEI sp. nov.

(Pl. XIII, figs. 1a–f.)

Monoicum, densiuscule cespitosum. Caulis erectus, brevis, 3–4 millim. altus. Folia siccitate crispata, madore patentia, 2–3 millim. longa, e basi oblonga sat subito constricta, longe et anguste acuminato-subulata, apice sinuato denticulata, marginibus planis et integris, costa percurrente, cellulis inferioribus rectangulis, 2–3 long. quam lat., superioribus irregularibus, plerisque subquadratis, opacis et papillosis, 9–15 μ longis, 8–9 latis, cellulis alaribus majoribus, subinflatis, lutescentibus. Flos masculus in ramo brevi. Folia perichætialia intima vaginantia, longe acuminata. Capsula in pedicello brevi, 7–8 millim. longo, nutans vel inclinata, breviter ovato-convexa, interdum strumulosa, levis vel vix striatula, operculo longe oblique rostrato, basi crenulato. Annulus distinctus. Peristomium elatum, intense purpureum, 0.5 millim. altum, valde papillosum, dentibus irregulariter bi-trifurcatis. Sporæ leves, 16–18 μ crassæ.

From Port Wells (Trelease, 2268, 2271).

This species is only comparable with *C. polycarpam* Sch., from which it is easily distinguished by its smaller size, its shorter, smooth or

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hardly striate capsule, its more papillose, longer and brighter purple peristome, its shorter leaves with a thinner subula, and its upper cells smaller and less distinct.

CYNODONTIUM POLYCARPUM ALASKANUM var. nov.

A forma typica differt foliis apice tantum denticulatis, marginibus minus late et minus longe revolutis, reteque levi vel sublevi, cellulis superioribus paulo majoribus et distinctioribus (20 × 13 μ, loco 14 × 11); a var. *laxirete* Dix. foliis angustioribus et rete basilari densiore distinctum; ab *Oncophoro suecico* Arn. et Jens. differt foliis inferne revolutis cellulisque alaribus indistinctis vel parum distinctis.

From Juneau (Trelease, 2176); Cape Fox (Trelease, 2374); Indian Camp, Yakutat Bay (Brewer and Coe, 645).

The type has been indicated for Alaska by Kellogg and by Lesquereux and James (Manual, p. 58).

Cynodontium virens Sch. Br. eur. Coroll., p. 12.

From Haenke Island (Coville and Kearney, 1110). A doubtful specimen from St. Matthew Island (Trelease, 2155).

Cynodontium virens serratum Sch., loc. cit.

From Haenke Island (Coville and Kearney, 1111); Egg Island (Coville and Kearney, 1016, 1017); Port Wells (Trelease, 2290; Brewer and Coe, 654); St. Matthew Island (Trelease, 1891).

Cynodontium wahlenbergii Hartm. Flor. scand., ed. 10, p. 113.

From Cape Vancouver (J. M. Macoun); Port Wells (Trelease, 1830, 2288 in part, 2289); Port Clarence (Brewer and Coe, 669); Hall Island (Trelease, 1882, 1898, 1899, 2130, 2132); St. Lawrence Island (Trelease, 1895, 1896, 1897, 2124); St. Matthew Island (Trelease, 1892, 1906, 2156, 2157, 2162).

Number 2130 is a small form with short leaves, forma *brevifolia*.

Dichodontium pellucidum Sch. Br. eur. Coroll., p. 12.

From Hidden Glacier Inlet in Yakutat Bay (Trelease, 1816, 2154 in part); Disenchantment Bay (Brewer and Coe, 639 in part); Muir Glacier (Trelease, 1752 in part); Port Wells (Trelease, 1831); Unalaska Island (J. M. Macoun).

Dichodontium pellucidum fagimontanum Sch., loc. cit.

From Juneau (Trelease, 2171); Muir Glacier (Trelease, 1909 in part).

Numbers 1816, 2154 in part and 1831 are forms passing to var. *fagimontanum*.

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DICHODONTIUM PELLUCIDUM KODIAKANUM var. nov.

(Pl. XIII, fig. 2^{a-b}.)

Magnitudine *D. flavescenti* Lindb. simile, 5–8 centim. altum; folia subintegra, apice late obtuso tantum sinuolata, rete vix papilloso.

From Kodiak (Trelease, 1848).

D. pellucidum serratum Sch. (*D. flavescens* Lindb.) has been recorded from Alaska by Kindberg.

Aongstroemia longipes Br. eur., fasc. 33–36, p. 3, pl. 1.

From Muir Glacier (Trelease, 2422, 2466, 2468); Hidden Glacier Inlet, in Yakutat Bay (Trelease, 2519). New to Alaska.

Dicranella crispa Sch. Br. eur. Coroll., p. 13.

From Yakutat Bay (Trelease, 2334); St. Lawrence Island (J. M. Macoun).

Dicranella grevilleana Sch., loc. cit.

From Port Clarence (Trelease, 2103). New to Alaska.

Dicranella rufescens Sch., loc. cit.

From Prince of Wales Island (J. M. Macoun).

Dicranella heteromalla Sch., loc. cit.

From Juneau (Trelease, 2180; Setchell, 1235); Farragut Bay (Coville and Kearney, 470); Kodiak (Trelease, 2206, 2213, 2214); Douglas Island (Trelease, 2405, 2407, 2411); Prince of Wales Island (J. M. Macoun); Yes Bay (Gorman, 182 in part, 183).

Dicranella heteromalla orthophylla Lesq. & Jam. Manual, p. 67.

From Sitka (Trelease, 2367); Kodiak (Trelease, 2197); Douglas Island (Trelease, 2411).

DICRANELLA HETEROMALLA LATINERVIS var. nov.

A forma typica differt foliis brevius subulatis costaque latiore, circa ⅓ basis occupante.

From Douglas Island (Trelease, 2389).

D. squarrosa Sch. was recorded from Alaska, teste M. W. Harrington, by Lesquereux and James, and *D. subulata* Sch. and *D. polaris* Kindb. from the islands of Bering Sea, teste Macoun, by Kindberg. The specimen received by us as *D. subulata*, from St. Lawrence Island is *D. crispa*. We have not seen any specimens of the other two species.

Dicranum anderssonii Sch. Syn., ed. 1, p. 689.

From Port Wells (Trelease, 2277). New to Alaska.

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This moss undoubtedly belongs to *D. anderssonii* Sch. (*Arctoa anderssonii* Wich. in Flora, 1859, no. 27). In his second edition of the Synopsis, Schimper reunites it to *D. hyperboreum*, from which, however, it seems sufficiently distinct by its smaller, subglobose capsule, turbinate after the fall of the lid, very shortly pedicellate and almost always surrounded and surpassed by the perichætial leaves, and by the cells of the exothecium being smaller, with more solid and more colored walls. According to C. Jensen (Bryophyta of the Faeroes, in his Botany of the Faeroes, p. 159), the capsule of *Dicranum anderssonii* should be destitute of stomates, but in the Port Wells specimen all the capsules bear several stomates at the base of the very short neck.

Dicranum starkei Web. & Mohr, Bot. Taschb., pp. 189, 471.

From Yakutat Bay (Trelease, 2059); Disenchantment Bay (Brewer and Coe, 635). New to Alaska.

Dicranum albicans Br. eur., fasc. 43, Suppl., pl. 1.

From Yakutat Bay (Trelease, 2059 in part). New to Alaska.

A form of greener tint than usual and with homomallous leaves.

Dicranum strictum Schl. Pl. crypt. helv., cent. III, no. 26.

From Yakutat Bay (Trelease, 2331, 2336).

DICRANUM SUBFLAGELLARE sp. nov.

(Pl. XIII, fig. 3[a–e].)

A *D. flagellari* proximo differt defectu flagellarum, foliis erectis subfalcatis angustioribus parum flexuosis, brevioribus (2–2.5 millim.), acumine canaliculato non subtubuloso, marginibus dorsoque subintegro cellulisque inferioribus angustioribus, superioribus multo minoribus. Specimina pauca, sterilia.

From Kodiak (Trelease, 1899).

Dicranum elongatum Schl. Pl. crypt. helv., cent. III, no. 27.

From Port Clarence (Trelease, 1867 in part, 2117, 2118); Kodiak (Trelease, 2503); St. Lawrence Island (Trelease, 1892, 1894, 1897 in part); St. Matthew Island (Trelease, 2170).

Number 2503 is a short, stunted form, with nearly the facies of *D. miquelonense* Ren. & Card.

Dicranum groenlandicum Brid. Mant. musc., p. 68. Bryol. univ., I, p. 460.

From the Yukon River (W. H. Dall); Port Clarence (Trelease, 1867 in part). New to Alaska.

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Dicranum fuscescens Turn. Musc. hib., p. 60, pl. 5, f. 1.

From Yes Bay (Gorman, 184); Juneau (Brewer and Coe, 699*b*, 700); Skagway (Canby, 478); Wrangell (Trelease, 2317); White Pass, 3,000 ft. (Trelease, 2313); Farragut Bay (Trelease, 2416; Brewer and Coe, 617); Yakutat Bay (Trelease, 1763, 2340); Point Gustavus (Coville and Kearney, 777); La Perouse Glacier (Trelease, 2498); Sitka (U. S. S. *Albatross*, 53, 55; Canby, 458, 463; Trelease, 2359); Hot Springs (Trelease, 1914); Kodiak (Trelease, 1853); Douglas Island (Trelease, 1908, 2392); Port Wells (Trelease, 2282, 2288); Orca (Trelease, 1918, 1925, 2262; Setchell, 1213); New Metlakatla (Coville and Kearney, 364); Plover Bay, Siberia (Trelease, 1865).

The Yes Bay specimen was associated with *Mnium glabrescens* Kindb. and *Scapania* sp.

The Kodiak specimen (1853) is a paludal form, with entire, shorter, erect leaves. We must point out too a sterile form, collected on Unalaska Island by Mr. C. H. Townsend (U. S. S. *Albatross* exped., 43), which is very near *D. muehlenbeckii* Br. eur. var. *brevifolium* Lindb. The same form was found by Trelease on Hall Island (1907). It differs from the European plant chiefly in having its leaves less flexuous when dry.

Many authors separate *D. congestum* Brid. from *D. fuscescens* Turn. but as it is almost impossible to find two descriptions of *D. congestum* which agree, we can infer that it is one of those species which every author understands in his own way, that is to say a very bad species; and we deem it preferable to merely unite it with *D. fuscescens*.

Dicranum dipteroneuron C. Müll. in Flora, 1887, p. 221.

From valley of the Takhin River (Krause brothers).

Dicranum scoparium Hedw. Fund. musc., II, p. 92, pl. 8, f. 41, 42.

From Point Gustavus (Coville and Kearney, 772 in part.)

A paludal form.

Dicranum neglectum Jur. Laubm. fl., p. 47. Limpr. Laubm., I, p. 353. *D. spadiceum* ZETT. Musc. pyren., p. 30.

From Port Clarence (Trelease, 1868); Sturgeon River Bay, Kodiak (Trelease, 1929); Unalaska (U. S. S. *Albatross* exped., 7*a*); St. George Island (U. S. S. *Albatross* exped., 57); St. Lawrence Island (Trelease, 1873, 1874 in part, 1902); St. Matthew Island (Trelease, 1886, 1888 in part, 1980); Hall Island (Trelease, 1988, 1990, 1991). New to Alaska.

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Dicranum howellii Ren. & Card. in Bot. Gaz., 1889, p. 93, pl. XII, B.

From Skagway (Canby, 483); New Metlakatla (Trelease, 1906); Point Gustavus (Coville and Kearney, 755); Virgin Bay (Trelease, 2308); Sitka (Setchell, 1255; Trelease, 2360); Kodiak (Trelease, 2202, 2223, 2504); Unga (Saunders, 2294, 2295). New to Alaska.

Dicranum bonjeani De Not. apud Lisa Elencho, p. 29. Epil., p. 616.

From Sturgeon River Bay, Kodiak (Trelease, 1854).

A form nearly allied to var. *schlotthaueri* Barnes by its short and entire leaves. The type was recorded from Sitka and Nulato, teste Rothrock, by Kindberg, Mac. Cat. Can. pl., VI, Musci, p. 32.

Dicranum majus Sm. Fl. brit., III, p. 1202.

From Point Gustavus (Coville and Kearney, 754); Orca (Setchell, 1215); Sitka (Trelease, 1953; U. S. S. *Albatross* exped., 61); Hot Springs (Trelease, 1952).

Number 1215 Setchell, is a slender form.

Dicranum bergeri Bland. Musc. frond. exs., III, no. 114.

From Kodiak (Trelease, 1675*a* in part).

Dicranum molle Wils. is recorded from St. Paul Island and *D. angustifolium* Kindb. from Unalaska by Kindberg, in Mac. Cat. Can. pl., VI, Musci. *D. muehlenbeckii* has also been recorded from Alaska.

Dicranodontium longirostre Br. eur., fasc. 41, p. 2, pl. 1.

From Orca (Trelease, 1839). New to Alaska.

Dicranodontium aristatum Sch. Syn., ed. 1, p. 695.

From Hot Springs (Trelease, 1809). New to Alaska.

Slightly different from the European plant, the costa being rather less broad, but one fifth or one fourth the width of the leaf base, and having a less rough subula. *Dicranum virginicum* Aust. (*Campylopus virginicus* Lesq. & Jam.) is intermediate between the European and Alaskan forms.

Mr. Kindberg has, teste Macoun, reported from Alaska, *Campylopus schimperi* Milde.

Family SELIGERIACEÆ.

Blindia acuta Br. eur., fasc. 33–36, p. 3, pl. 1.

From Juneau (Coville and Kearney, 582); Port Wells (Trelease, 2274, 2275, 2276, 2280, 2291 in part); Hall Island (Trelease, 1881). New to Alaska.

Number 2280 is a form with long innovations, surpassing the capsule.

Blindia acuta flexipes Ren. & Card., in Rev. bryol., 1892, p. 79.

Port Wells (Trelease, 2286). New to Alaska.

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Family DITRICHACEÆ.

Ceratodon purpureus Brid. Br. univ., I, p. 480.

Very common and variable. From Juneau (Setchell, 1233; Coville and Kearney, 589; Trelease, 2175, 2177); New Metlakatla (Trelease, 2240); Wrangell (Trelease, 2316); Port Clarence (Trelease, 2106, 2107, 2108, 2109, 2110, 2111, 2112; Brewer and Coe, 671); Cape Fox (Trelease, 1934); Yakutat Bay (Trelease, 2326, 2332); Disenchantment Bay (Coville and Kearney, 1065; Brewer and Coe, 637); Muir Glacier (Trelease, 1801, 1804, 2443, 2446, 2447, 2450, 2465); Orca (Trelease, 2255, 2256); Bogoslof volcano (Coville and Kearney, 2614 in part); Sitka (Coville and Kearney, 868; Trelease, 2361; Canby, 460); Kodiak (Trelease, 2189, 2198, 2212, 2224, 2226); Douglas Island (Trelease, 2393, 2404); Prince of Wales Island (J. M. Macoun); Bering Island (J. M. Macoun); Hall Island (Trelease, 2139); St. Paul Island (Trelease, 1860, 2086); Plover Bay, Siberia (Trelease, 2097, 2531, 2532, 2536, 2537, 2546; Coville and Kearney, 1862).

Ceratodon heterophyllus Kindb. in Ott. nat., v, p. 179. Macoun, Cat. Can. pl., VI, Musci, p. 261.

From St. Paul Island (J. M. Macoun; B. W. Evermann; Trelease, 2062, 2070, 2071, 2072, 2075).

Distichium capillaceum Br. eur., fasc. 29–30, p. 4, pl. 1.

From White Pass (Trelease, 2310); Port Wells (Brewer and Coe, 653; Coville and Kearney, 1291 in part; Trelease, 2278, 2291); Orca (Trelease, 1837, 1838, 2260 in part); Yakutat Bay (Brewer and Coe, 644); Port Clarence (Trelease, 2104).

Ditrichum homallum Hpe. in Flora, 1867, p. 182.

From Kodiak (Brewer and Coe, 658 in part). New to Alaska.

A slender etiolated form, of which we find only some stems among other mosses; leaves erect, costa narrower, basilar cells broader.

Ditrichum flexicaule densum Sch. has, teste Rothrock, been recorded from Alaska by Lesquereux and James, and *D. glaucescens* Hpe., teste Macoun, from Unalaska, by Kindberg. Kindberg has also, teste Macoun, described a *Leptotrichum tomentosum* from St. Paul Island.

Family POTTIACEÆ.

POTTIA HEIMII BERINGIANA var. nov.

(Pl. XIV, fig. 2[a–f].)

A forma typica differt foliis brevioribus, limbo lutescente circumductis, costa breviter excurrente mucronatis reteque magis opaco valde papilloso.

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From St. Matthew Island (Trelease, 2151 in part).

We found only a few stems of this moss, mixed with *Barbula brachypoda* Card. & Thér. and a *Bryum*. By the pellucid margin of the leaves, it is nearly related to *P. obtusifolia* C. Müll. (*P. heimii arctica* Lindb.), but it is easily distinguished from it by its pointed leaves. It also closely resembles *Desmatodon systylioides* Ren. & Card., from Labrador, which is probably also a *Pottia* of the same group, but it differs from this species by its ovate, shorter and proportionately wider capsule, its longer and more finely beaked lid, its shorter and more briefly acuminate leaves, and finally by its areolation formed of larger and less obscure cells.

According to J. M. Macoun *P. heimii* typica has been recorded by Kindberg from St. Matthew Island and from Bering Island.

Didymodon rubellus Br. eur., fasc. 29–30, p. 3, pl. 1.

From Juneau (Trelease, 2178); Port Wells (Trelease, 2272, 2283); Agattu Island (U. S. S. *Albatross* exped., 36); St. Matthew Island (Trelease, 2143, specimen in bad condition, and determination doubtful); Bering Island (J. M. Macoun).

Didymodon baden-powelli Kindb. Ott. Nat., v, p. 179. Macoun, Cat. Can. pl., vi, Musci, p. 262.

From St. Paul Island (J. M. Macoun).

Contrary to Kindberg's description, the leaves are entire or nearly so on the specimen we have seen. It is probable that this moss is but a form of *D. rubellus*.

TRICHOSTOMUM CUSPIDATISSIMUM sp. nov.

(Pl. xiii, fig. 4a–e.)

Dioicum, elatum, compacte cespitosum, fusco-lutescens. Caulis erectus, circa 5 centim. altus, dense foliosus, rufo-tomentosus, ramis erectis numerosis. Folia siccitate crispata, madore erecto-arcuata, ad apicem caulis et ramorum congesta, fragilia (acumine sæpe effracto), e basi ovata sensim et longissime acuminata, 3–3.5 millim. longa, 0.45–0.7 lata, marginibus planis, superne inflexis, papillis prominentibus crenulatis, costa angusta, 80–90 μ basi lata, in cuspidem acutissimam longe excurrente, cellulis inferioribus rectangulis, 5–6 long. quam lat., lutescentibus, superioribus plerumque quadratis, 10–12 μ latis, opacis, grosse papillosis. Cætera desunt.

From Hall Island (Brewer and Coe, 674).

A fine species, easily distinguished from the large forms of *T. mutabile* Bruch, and its var. *cuspidatum* Limpr. (*T. cuspidatum* Sch.),

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by the form of the leaves, and more particularly by its narrower costa and its upper cells which are much larger and more distinct (10–12 μ instead of 6–8).

TRICHOSTOMUM SITKANUM sp. nov.

(Pl. xiv, fig. 1a–e.)

Dioicum? Cespites densiusculi, superne virides, intus nigrescentes, inferne terra obruti. Caulis 2–3 centim. altus, parum divisus, laxe foliosus. Folia mollia, sicca cirrato-crispata, madore patula, inferiora 2.5–3 millim. longa, superiora majora, 4–4.5 millim. longa, e basi longe subvaginante lineari-lanceolata, marginibus planis integris, costa sat valida, basi circa 110 μ lata, in mucronem lutescentem breviter excurrente, cellulis basis subvaginantis rectangulis, hyalinis, 4–6 long. quam lat., cæteris quadrato-hexagonis, 12–14 μ latis, valde papillosis. Cætera desunt.

From Sitka (Trelease, 2370).

The aspect, the form of leaves, the looser basal areolation and the upper cells more papillose, easily distinguish this plant from *T. cuspidatissimum* Card. & Thér. It is more closely connected with *T. bambergeri* Sch., but the latter has the costa shining on the back in a dry state, and the hyaline cells of the base going up along the borders of the leaf, as in *Barbula tortuosa* Web. & Mohr.

Desmatodon latifolius Br. eur., fasc. 18–20, p. 5, pl. 1.

From Unalaska (J. M. Macoun).

BARBULA BRACHYPODA sp. nov.

(Pl. xiv, figs. 3a–i.)

Monoica, laxiuscule cespitosa, viridis. Caulis 5–10 millim. altus, erectus, simplex furcatusve. Folia mollia, sicca erecta, madida erecto-patentia, elliptica vel subspathulata, 2.5–3 millim. longa, 0.6–1 millim. lata, late et breviter acuminata obtusa, subobtusa acutave, marginibus e basi ad medium usque revolutis, deinde planis et pro more limbo lutescente e 3–4 seriebus cellularum composito limbatis, costa angusta (lat. 50 μ), paulo sub apice evanida, rete levi, in dimidio inferiore laxissimo hyalino, cellulis rectangularibus, 66–88 μ longis, circa 22 latis, superne valde chlorophylloso, cellulis inæqualibus quadrato-rotundatis vel brevissime rectangulis, e costa ad margines sensim minoribus (majoribus 25 μ longis, 16 latis, minoribus quadratis, 14 μ latis). Flos masculus infra femineum situs. Folia perichætialia caulinis majora, acuminata, intima angustissima. Capsula in pedicello brevi, crassiusculo, pallido,

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5–7 millim. longo, 0.2 millim. crasso, erecta, cylindrica, circa 2 millim. longa, operculo conico tertiam partem capsulæ æquante. Annulus latus, distinctus. Peristomium papillosum, membrana basilari brevi, dentibus semel vel bis convolutis. Sporæ leves, 12–16 μ crassæ.

From St. Matthew Island (Trelease, 2151 in part, 2166).

This species, which belongs to the section *Cuneifoliæ* Sch., is easily distinguished from *B. cuneifolia* Brid. by its leaves revolute below, its longer lower cells, the upper more chlorophyllose with thicker walls, its shorter seta, its broad annulus, etc.

Kindberg has established (in Revue bryologique, 1896, p. 22) a *B. subcuneifolia* from Alaska, which, by some characters, seems to be near to our *B. brachypoda*; but his description is so incomplete that we can neither ascertain whether this *B. subcuneifolia* is identical with the plant here described, nor, with still more reason, mention the characters which might distinguish it from the former.

BARBULA SAUNDERSII sp. nov.

(Pl. XVI, fig. 1[a–i].)

Dioica? laxiuscule cespitosa, olivaceo-viridis. Caulis brevis, 5–8 millim. altus, simplex vel parce divisus. Folia sicca incurvata, madida erecta vel erecto-patentia, 1.5–2 millim. longa, 0.8 lata, e basi ovata breviter acuminata, obtusa vel brevissime mucronata, marginibus e basi usque ad ⅔ valde revoluta, superne concava, costa valida, tota fere longitudine æqualiter crassa (0.1 millim.), dorso valde prominente, percurrente, rarius paulisper excedente; rete levi, cellulis inferioribus laxis, rectangulis, lutescentibus, 40 μ longis, 12 latis, sequentibus quadratis, 12–13 μ latis, parietibus incrassatis, mediis et superioribus minutis, 7–8 μ latis, parum distinctis. Folia perichætialia caulinis majora, sicca erecto-incurvata, madida erecta, appressa. Capsula in pedicello purpureo, circa 10 millim. longo, siccitate sinistrorsum torto, erecta, oblonga vel subcylindrica, 1–1.25 millim. longa, operculo conico longissimo, capsulam æquante. Peristomium purpureum, papillosum, membrana basilari brevi, 30 μ alta, dentibus semel vel bis contortis. Sporæ leves, 14–16 μ crassæ.

From Hidden Glacier Inlet, Yakutat Bay (Trelease, 2514).

In habit recalls the smallest forms of *B. unguiculata* Hedw., from which it differs by the shorter and proportionately broader leaves, which are shortly ovate-lanceolate, not or hardly mucronate, etc. By the form of the leaves, it is also connected with *B. brachyphylla* Sulliv., but the latter has the stems much longer and the basal areolation of the leaves quite different.

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BARBULA TRELEASEI sp. nov.

(Pl. xv, fig. 2[a–g].)

Dioica? dense cespitosa, lutescenti-viridis. Caulis 1–2 centim. altus, erectus, divisus. Folia siccitate crispatula, madore erecto-patentia, circa 1.5 millim. longa, 0.6 lata, ovato-lanceolata, breviter acuminata, integra, marginibus e basi longe revolutis, costa valida, rubella, percurrente, basi 80 μ crassa, cellulis inferioribus rectangulis subhyalinis, levibus, mediis superioribusque minutis (diam. 8 μ), quadratis, valde papillosis, parum distinctis. Folia perichætialia multo longiora et latiora, sat subito constricta, longe acuminata, madore arcuato-patula, intima subvaginantia, in dimidio inferiore hyalina. Capsula in pedicello 10–11 millim. longo, erecta, oblongo-cylindrica. Cætera desunt.

From Juneau (Trelease, 2179, 2181).

This moss has the aspect of a slender *B. fallax* Hedw.; but the exture of the leaf base, formed of rectangular subhyaline cells, clearly separates it. On the other hand, it differs from *B. vinealis* Brid. and allied forms by the much shorter leaves.

BARBULA RIGENS sp. nov.

(Pl. xv, fig. 1[a–g].)

Rubella, laxe cespitosa vel aliis muscis gregarie intermixta. Caulis gracilis, erectus, rigidulus, divisus, 1–2 centim. altus. Folia sicca crispatula, madida erecto-patentia, stricta, breviter lanceolato-linearia, 1.25–1.5 millim. longa, 0.3 lata, marginibus integris medium versus paululum revolutis, costa valida, tota fere longitudine æqualiter crassa, diam. 56 μ, biconvexa, percurrente vel in mucronem brevem excurrente, cellulis inferioribus rectangulis, hyalinis, plerumque levibus, superioribus opacis, indistinctis, quadrato-rotundatis, utraque pagina dense papillosis, mediis circa 11 μ latis. Cætera ignota.

From Orca (Trelease, 2260; mixed with *Distichium capillaceum* and *Anœctangium compactum*).

This species belongs to the group of *B. rigidula* Mitt., from which it is easily distinguished by its stiff stem and leaves, the latter being shorter and very briefly acuminate and by its much more papillose areolation.

Barbula cylindrica Sch. in Hedwigia, 1873, p.47. Syn., ed. 2, p. 208.

From Prince of Wales Island (J. M. Macoun).

Barbula fragilis Br. eur., fasc. 62–64, Suppl., pl. 4.

From Port Wells (Coville and Kearney, 1291 in part).

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Barbula aciphylla Br. eur., fasc. 13–15, p. 42, pl. 26.

Yakutat Bay (Trelease, 1746 in part); Muir Glacier (Trelease, 1802). New to Alaska.

Number 1802 is a rather badly characterized form, which can be ascribed to *B. aciphylla*, but which has also some relationship with *B. ruralis* Hedw.

Barbula ruralis Hedw. Fund., II, p. 92.

From Agattu Island (U. S. S. *Albatross* Exped., 42).

A form having the facies of *B. muelleri* Bruch.

Mr. Kindberg has described from Alaska a *B. subcuneifolia* and a *B. ruralis* subsp. *alaskana*, of which we have seen no specimens.

Family GRIMMIACEÆ.

Grimmia apocarpa Hedw. Descr., I, p. 104, pl. 39.

From Juneau (Trelease, 2183); Muir Glacier (Trelease, 2432); Kodiak (Trelease, 2215); Hall Island (Trelease, 2128); St. Paul Island (Trelease, 2079).

Grimmia apocarpa gracilis Web. & Mohr, Taschenb., p. 131.

From White Pass (Trelease, 2493); Muir Glacier (Trelease, 1789, 2454); Hidden Glacier Inlet, Yakutat Bay (Trelease, 1790, 2058); Kodiak (Trelease, 1788); Hall Island (Trelease, 1880).

Grimmia apocarpa alpicola Hook. & Tayl. Muscol. brit., p. 87.

From Portage Bay (U. S. S. *Albatross* Exped.); Cape Fox (Trelease, 2386); St. Paul Island (Trelease, 2080).

A form allied to this variety by the dimension of its spores, but differing from it by its sharp pointed leaves, the upper ones ending in a hyaline point, was collected at Wrangell (Canby, 471); Cape Fox (Trelease, 2385) and at Hot Springs, near Sitka (Trelease, 2495).

Grimmia apocarpa rivularis Web. & Mohr, Taschenb., p. 129.

From Muir Glacier (Trelease, 2424, 2494); Yakutat Bay (Trelease, 2324).

Grimmia conferta Funck, Moostaschenb., p. 18, pl. 12.

From St. Paul Island (Trelease, 2470*a*); St. Matthew Island (Trelease, 2167).

Seems to belong to *G. conferta* by the short, hemispherical capsule, but the peristome is wanting.

Grimmia maritima Turn. Muscol. hib., p. 23, pl. 3, f. 2.

From Virgin Bay (Trelease, 2303); Port Wells (Trelease, 2279); Yakutat Bay (Trelease, 2325); Kodiak (Trelease, 2205, 2216); Agattu Island (U. S. S. *Albatross* Exped., 62). New to Alaska.

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Grimmia torquata Grev. Scot. crypt. fl., IV, p. 199.

From Kodiak (Trelease, 2203, 2204).

Grimmia elatior Br. eur., fasc. 25–28, p. 17, pl. 10, *forma?*

From Yukon River (W. H. Dall). New to Alaska.

We find only some stems of this moss, with a single capsule, mixed with *Polytrichum yukonense* Card. & Thér., and their determination remains rather doubtful.

Kindberg has recorded from Alaska *G. agassizii* Sulliv. and Lesq. and from Unalaska *G. crassinervis* C. Müll.

Rhacomitrium patens Hüb. Muscol. germ., p. 198.

From Unalaska (J. M. Macoun).

RHACOMITRIUM SUDETICUM ALASKANUM var. nov.

Forma minor, habitu varietati *tenellum* Boul. similis, sed foliis subepiliferis vel apiculo hyalino omnino destitutis costaque validiore distincta.

Hidden Glacier Inlet, Yakutat Bay (Trelease, 2508 in part).

Rhacomitrium aciculare Brid. Mant., p. 80.

From Juneau (Coville and Kearney, 573); Kodiak (Trelease, 1849).

Rhacomitrium nevii Wats. Bot. Calif., II, p. 381.

From Juneau (Trelease, 2174); Atka Island (J. M. Macoun).

Rhacomitrium fasciculare Brid. Mant., p. 80.

From Portage Bay (U. S. S. *Albatross* Exped.); Yakutat Bay (Trelease, 1785, 2322); Cape Fox (Trelease, 2377); Muir Glacier (Trelease, 1781, 2455); Kodiak (Trelease, 1786, 2193); Sitka (U. S. S. *Albatross* Exped., 47); Hot Springs (Trelease, 1769, 2346, 2350).

Number 2322 is a forma *minor*.

Rhacomitrium tenuinerve Kindb. Rev. bryol., 1896, p. 19.

R. fasciculare var. *haplocladon* KINDB. Not. on Can. bryol., 1893.
R. microcarpum var. *palmeri* KINDB. apud Macoun, Cat. Can. pl., VI, Musci, p. 267.
R. palmeri KINDB. Rev. bryol., 1896, p. 19.

From St. Paul Island (J. M. Macoun); St. Matthew Island (Trelease, 1885, 2169); Pribilof Islands (Palmer, 1891).

R. tenuinerve and *palmeri* of Kindberg surely constitute but one species, which differs from *R. fasciculare* Brid. principally by its weak, flat costa, disappearing far from the point. Kindberg is mistaken in attributing to *R. palmeri* a percurrent or subexcurrent costa.

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On the original specimen collected by Palmer, and which Kindberg himself formerly communicated to us, the costa has exactly the same length and the same structure as in *R. tenuinerve*. The latter is a form with long simple or hardly branched stems, whereas *R. palmeri* is a shorter and more ramulose form.

RHACOMITRIUM CYCLODICTYON sp. nov.

(Plate xv, fig. 3[a–g].)

Dioicum? parvum, dense cespitosum, atrofuscum. Caulis depressus, ramosissimus, ramis confertis, erectis, brevibus, 3–5 millim. longis. Folia siccitate suberecta vix flexuosa, madore erecto-patentia, 1.25 millim. longa, 0.5 lata, ovato-lanceolata, mutica, integerrima, inferne marginibus revoluta, costa sat tenui, 35–40 μ crassa, paulo sub apice evanida, rete subæquali, cellulis infimis juxta costam paucis rectangulis vel sublinearibus, haud sinuosis, omnibus cæteris rotundatis vel brevissime ovatis, 8–12 μ latis, parietibus incrassatis, levibus sed valde convexis, ita ut papillas maximas æmulent. Folia perichætialia multo majora, e basi subvaginante sensim et longe acuminata, madore erecta. Capsula in pedicello brevi, purpureo, demum nigricante, siccitate sinistrorsum torto, 5 millim. longo, erecta, anguste cylindrica, 1.5 millim. longa, 0.3 crassa. Sporæ minute granulosæ, diam. 16–17 μ. Cætera ignota.

From Muir Glacier (Trelease, 2431).

A most remarkable species, which cannot be mistaken for any other on account of its characteristic areolation very different from that of all known species of the genus *Rhacomitrium*.

Rhacomitrium heterostichum Brid. Mant., p. 79.

From Hot Springs (Trelease, 1773, 1774); Kodiak (Trelease, 1776); Orca (Trelease, 1961 in part).

Rhacomitrium heterostichum affine (Schleich.) Card. and Thér.

From Unalaska (Trelease, 2296).

Rhacomitrium lanuginosum Brid. Mant., p. 79.

From Juneau (Setchell, 1240); New Metlakatla (Trelease, 1949); Virgin Bay (Trelease, 1775); Sitka (Trelease, 1772); Kodiak (Brewer and Coe, 655); Hall Island (Trelease, 1777, 1778); St. Matthew Island (Trelease, 1856).

Number 1949 is the form *falcata* Boul. Numbers 1777, 1778 and 1856 belong to a form *stricta*. (Branches rigid when dry, subdistichous; leaves erect-appressed.)

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Rhacomitrium canescens Brid. Mant., p. 78.

From Orca (Setchell, 1211); Muir Glacier (Trelease, 1764*b*, 1766, 1767, 1768, 2423, 2429, 2456); Hidden Glacier Inlet, Yakutat Bay (Trelease, 1780 in part); Disenchantment Bay (Trelease, 1779 in part); Unalaska (J. M. Macoun).

Rhacomitrium canescens ericoides Br. eur., fasc. 25–28, p. 12, pl. 8, fig. *γ*.

From Yakutat (Trelease, 1794); Disenchantment Bay (Trelease, 1065 in part, 1770, 1779 in part, 2505, 2506; Brewer and Coe, 639, 640); Hubbard Glacier (Coville and Kearney, 1071, 1073 in part, 1065 in part); Hidden Glacier Inlet (Trelease, 1771, 1780 in part); Russell Fiord (Coville and Kearney, 995); Muir Glacier (Trelease, 1764, 1765, 2418, 2430, 2464); Muir Inlet (Coville and Kearney, 636); Point Gustavus (Coville and Kearney, 776).

Numbers Trelease, 1780 in part, and Coville and Kearney, 1073 in part, constitute a form *epilosa* or *subepilosa*.

Coscinodon pulvinatus Spreng. has, teste M. W. Harrington, been recorded from Alaska by Lesquereux and James.

Family ORTHOTRICHACEÆ.

Amphoridium lapponicum Sch. Syn., ed. 1, p. 247.

From Orca, 1,200 ft. (Trelease, 2246); Port Wells (Brewer and Coe, 651); Yakutat Bay (Trelease, 2323).

Amphoridium mougeotii Sch. Syn., ed. 1, p. 248.

From Juneau (Coville and Kearney, 577). New to Alaska.

Ulota drummondii Brid. Bryol. univ., 1, p. 299.

From Kodiak (Trelease, 2209); Unga (Saunders, 2292).

Ulota phyllantha Brid. Mant., p. 113.

From Bailey Harbor (U. S. S. *Albatross* Exped.); Cape Fox (Trelease, 2837); Yakutat Bay (Trelease, 2337*a*); Unalaska (Trelease, 2297); Kodiak (Trelease, 2210, 2227); Baranof Island (Trelease, 2348); St. Paul Island (Trelease, 2078, 2470 in part).

Numbers 2348 in part, 2470, 2337*a* and 2297 belong to the form called *U. maritima* by C. Müller and Kindberg.

ULOTA ALASKANA sp. nov.

(Pl. xv, fig. 4*a–g*.)

Ex affinitate *U. crispæ* Brid., a qua primo visu differt magnitudine, habitu robustiore (caule 2–4 centim. alto, valde ramoso), pedicello longiore (4–6 millim.), foliis inferne angustius hyalino-limbatis (4–5

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seriebus cellularum), sporis majoribus, diam. 19–23 μ, et præsertim capsula siccitate ore dilatata, nunquam infra orificium constricta.

From Wrangell (Coville and Kearney, 407); Point Gustavus (Coville and Kearney, 774); New Metlakatla (Trelease, 2239); Yakutat Bay (Trelease, 2337); Virgin Bay (Trelease, 2499); Hot Springs (Trelease, 2347).

By the shape of its capsule, dilated at the mouth, this species is very distinct from *U. bruchii* Hornsch. and *U. intermedia* Sch. It cannot be, either, mistaken for *U. connectens* Kindb., which, according to the author, has a short, hardly emergent seta. *U. camptopoda* Kindb. would appear, according to the description, nearer to *U. alaskana*, but as Kindberg has recently joined it to his *U. connectens*, we need not take it into account. Besides, he gave it the aspect of *U. crispula* Bruch, which does not at all agree with our *U. alaskana*, characterized by its great size and the length of its seta.

ULOTA CRISPA SUBCALVESCENS var. nov.

Capsula brevis, madida ut in *U. crispula*, sed sicca et vacua sub ore constricta ut in *U. crispa*. Calyptra tantum apice pilosa.

Baranof Island (Trelease, 2348 in part).

Two small tufts, mixed with *U. phyllantha* Brid.

Ulota barclayi Mitt. Journ. Linn. Soc., VIII, p. 26.

From Cape Fox (Trelease, 2384). First discovered at Sitka by Barclay.

Orthotrichum arcticum Sch. Br. eur. Suppl., pl. 5, et Syn., ed. 2, p. 310.

From St. Paul Island (Trelease, 2081, 2470). New to Alaska.

ORTHOTRICHUM FENESTRATUM sp. nov.

(Pl. XVI, fig. 2^{a-n}.)

Monoicum, laxiuscule pulvinatum, atroviride, intus nigricans. Caulis pluries divisus, 1–1.5 centim. altus. Folia erecta, sicca imbricata, madida vix patentia, media 3.5 millim. longa, 0.75–1 lata, superiora majora, lanceolata vel ovato-lanceolata, acuta, marginibus integris usque apicem versus revolutis, costa angusta fuscescente sub apice evanida, cellulis inferioribus subhyalinis, rectangulis, 2–4 long. quam lat., margines versus brevioribus, parietibus sinuosis, mediis et superioribus inæqualibus, rotundatis vel breviter ovatis, diam. 9–12 μ, parietibus incrassatis. Flos masculus sub femineo sessilis, foliis perigonialibus brevibus, apice rotundatis, ecostatis vel obsolete costatis, para-

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physibus filiformibus. Capsula in pedicello brevi, 1–2 millim. longo exserta, pallide lutea, ovato-pyriformis, sicca subglobosa basi abrupte constricta, madida sensim collo longo in pedicello defluente attenuata, levis vel siccitate vix plicatula, cum collo 3 millim. longa, 1.5 crassa, stomatibus emersis, fasciis subindistinctis, cellulis paululum flavidioribus et magis incrassatis compositis, operculo depresso, longirostro. Calyptra conico-campanulata, plicatula, pilis paucis albidis ornata, apice brunnea. Vaginula nuda. Peristomium, ut videtur, simplex, dentibus 8 bigeminatis, pallide luteis, granulosis, siccitate erectis vel patentibus, in dimidio superiore cancellatis et cribroso-perforatis. Sporæ pro genero maximæ, diam. 24–28 μ, fuscæ, papillosæ.

From St. Paul Island (J. M. Macoun).

This moss was distributed as *O. anomalum* Hedw., but it bears no resemblance to that species. It is allied to *O. cribrosum* C. Müll. from the Chukchi peninsula, Siberia, chiefly by the shape of the capsule and the structure of the peristomial teeth, but it differs from it by its larger size and the leaf-areolation, composed of less incrassate and less papillose cells. In *O. cribrosum* the leaf-cells are strongly incrassate and coarsely papillose from the base.

Orthotrichum speciosum Nees v. Esenb. in Sturm, Deutsch. Fl., fasc. 17.

From Point Gustavus (Coville and Kearney, 791).

A doubtful specimen also from Wrangell (Trelease, 2314 in part).

Orthotrichum pulchellum Brunt. in Engl. bot., pl. 1787.

Prince of Wales Island (J. M. Macoun); Disenchantment Bay (Trelease, 2513); Wrangell (Trelease, 2314 in part); Sitka (Trelease, 2353).

Family ENCALYPTACEÆ.

Encalypta vulgaris Hedw. Sp. musc., p. 60.

From Juneau (Setchell, 1233 in part).

E. commutata Nees & Hornsch., *E. rhabdocarpa* Schw., *E. macounii* Aust. and *E. alaskana* Kindb. have been reported from Alaska.

Family TETRAPHIDACEÆ.

Tetraphis geniculata Girg. mss. Milde in Bot. Zeit., 1865, p. 155.

From Port Etches (J. M. Macoun); Sitka (J. M. Macoun; Trelease, 2352, 2362, 2363); Virgin Bay (Trelease, 2306); Orca (Trelease, 2263); Douglas Island (Trelease, 2394, 2401, 2413).

Tetraphis pellucida Hedw. has also been reported from Sitka.

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Family SPLACHNACEÆ.

Dissodon splachnoides Grev. & Arn. in Mem. Wern. Soc., v, p. 468, pl. 15.

From Port Wells (Coville and Kearney, 1292, 1295).

Tayloria serrata Br. eur., fasc. 23–24, p. 6, pl. 1.

From St. Paul Island (J. M. Macoun).

Tayloria tenuis Sch. Syn., ed. 2, p. 360.

From Yakutat Bay (Trelease, 2321, 2474); Virgin Bay (Trelease, 2475); Douglas Island (Trelease, 2471, 2472). New to Alaska.

Tetraplodon mnioides Br. eur., fasc. 23–24, p. 5, pl. 2.

From Wrangell (Coville and Kearney, 432); Yakutat Bay (Trelease, 2473); New Metlakatla (Trelease, 2477); Kodiak (Trelease, 2502); Popof Island (Saunders, 2479); Hall Island (Trelease, 2481); St. Matthew Island (Trelease, 2482; Coville and Kearney, 2114); St. Paul Island (J. M. Macoun).

Tetraplodon mnioides cavifolius Sch. Syn., ed. 1, p. 304.

From Port Clarence (Trelease, 2480); St. Matthew Island (Brewer and Coe, 682, 683).

Tetraplodon urceolatus Br. eur., fasc. 23–24, p. 7, pl. 3.

From St. Matthew Island (J. M. Macoun).

Splachnum sphæricum Linn. fil. apud Swartz, Method. musc., p. 33, pl. 1, f. 1.

From Wrangell (Coville and Kearney, 431); Sitka (Trelease, 2473, 2478); Yes Bay (Gorman, 129½); Unalaska (Trelease, 2298, 2476).

Splachnum wormskjoldii Hornem. in Fl. dan., x, fasc. 28, p. 8, pl. 1659.

From St. George Island (J. M. Macoun).

Splachnum luteum Linn. Fl. suec., p. 954.

From Koyukuk River (F. C. Schrader, 1899). New to Alaska.

S. vasculosum Linn. has, teste Bischoff, been reported from Sitka by Lesquereux and James.

Family FUNARIACEÆ.

ENTOSTHODON SPATHULIFOLIUS sp. nov.

(Pl. xvii, fig. 1[a–f].)

Polygamus, densiuscule cespitosus, superne viridis, intus fuscescens. Caulis erectus, 10–15 millim. altus, radiculosus, ramosus, ramis gracilibus claviformibus, sub perichætiis nascentibus. Folia mollia, sicca erecto-appressa, interdum subcrispata, madida patula, inferiora minuta,

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ovata, superiora majora, 1.5–2 millim. longa, 1 lata, oblongo-spathulata, integra, obtusa subapiculatave, marginibus planis; basin versus interdum subrevolutis, costa tenui, attenuata, plus minus longe ab apice evanida, rete laxo, cellulis basilaribus subrectangulis, 60–80 μ longis, 30 μ latis, mediis superioribusque brevioribus, rectangulis, quadratis vel subhexagonis, long. 25–30 μ, lat. 20 μ, marginalibus sæpe longioribus angustioribusque, lutescentibus, 1–2-seriatis. Flores polygami, terminales, nunc unisexuales, nunc synoici; flores masculi in extremitate ramorum nascentes. Capsula in pedicello pallide luteo, 6–9 millim. longo, flexuoso, oblique erecta, pyriformis, collo distincto attenuata, operculo convexo, mamillato. Calyptra brevis, cucullata, haud vel vix inflata. Cætera ignota.

From St. Paul Island (Trelease, 2067, 2074).

A remarkable species, very distinct from all the *Entosthodon* of Europe and North America by its polygamous inflorescence, its leaves shortly spatulate, obtuse or subapiculate, and its calyptra hardly swelling. It is much to be regretted that the too immature capsules do not show the peristome, annulus and spores.

Funaria hygrometrica Sibth. Fl. oxon., p. 288.

From Alaska, sine loco (W. H. Evans); Douglas Island (Trelease, 2402).

Funaria hygrometrica calvescens Br. eur., fasc. 11, p. 8, pl. 3.

From Fort Yukon (F. C. Schrader).

Family BARTRAMIACEÆ.

Bartramia ithyphylla Brid. Muscol. recent., II, part III, p. 132, pl. 1, f. 6.

From Port Clarence (Trelease, without number); Disenchantment Bay (Trelease, 2520); Orca, 1,400 ft. (Trelease, 2242, 2483 in part); Kodiak (Trelease, 2488); Hall Island (Trelease, 2126); St. Paul Island (J. M. Macoun).

Bartramia ithyphylla strigosa Wahlenb. Fl. lapp., p. 362.

Bartramia ithyphylla var. *rigidula* SCH. Syn., ed. 2, p. 510.
Bartramia ithyphylla subsp. *rigidula* KINDB. Eur. and N. Amer. Br., p. 323.

From St. Matthew Island (Trelease, 2147, 2152, 2164; Coville and Kearney, 2181; Brewer and Coe, 679, 681).

Bartramia pomiformis Hedw. Sp. musc., p. 164.

From Yes Bay (Gorman, 183); Juneau (Coville and Kearney, 574, 577 in part); Orca (Setchell, 1216; Trelease, 2243, 2483); Virgin Bay (Trelease, 2485); Douglas Island (Trelease, 2408).

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Bartramia œderi Sw. in Schrad. Journ. bot., II, p. 181, pl. 3 B, f. 5.

From Juneau (Coville and Kearney, 572); Port Wells (Coville and Kearney, 1291).

B. menziesii Turn., *B. subulata* Br. eur., *B. breviseta* Lindb. and *B. circinnulata* C. Müll & Kindb. have been reported to occur in Alaska and the islands of Bering Sea.

Conostomum boreale Sw. in Schrad. Journ. bot., I, III, p. 26, pl. 5.

From Port Wells (Trelease, 2281, 2486, 2487); Orca (Trelease, 2484); Hall Island (Trelease, 2137, 2138).

Philonotis macounii Lesq. & Jam. Man., p. 208.

From Juneau (Canby, 487; Coville and Kearney, 585); Muir Glacier (Trelease, 1783 in part; specimen in bad state, and rather doubtful). New to Alaska.

Philonotis fontana Brid. Bryol. univ., II, p. 18.

From Muir Glacier (Trelease, 1799, 1800, 1803, 1899, 1910, 2437, 2438, 2444, 2451; Coville and Kearney, 637 in part); Point Gustavus (Saunders, 1798; Coville and Kearney, 760); Hidden Glacier Inlet, Yakutat Bay (Trelease, 1811, 1812); Disenchantment Bay (Trelease, 1823, 1827, 2509, 2510; Coville and Kearney, 1073); head of Russell Fiord (Coville and Kearney, 961); Kukak Bay (Saunders, 1855); Kodiak (Trelease, 1789, 1843, 1852, 1928, 2190?; Brewer and Coe, 657); Unalaska (Coville and Kearney, 1743, 1744); Popof Island (Saunders, 1859; Trevor Kincaid); St. Matthew Island (Trelease, 1894); Attu Island (J. M. Macoun); St. Paul Island (J. M. Macoun).

A very variable plant. The numbers 1789, 1843, 1852, 1855 and 1928 of Trelease, as well as numbers 1743 and 1744 of Coville and Kearney, are forms more or less resembling var. *cæspitosa*. A specimen gathered on Unalaska Island by Mr. J. M. Macoun is a form remarkable by its subacute, distinctly nerved perigonial leaves, and by its stem-leaves, which are hardly revolute on the borders and possess a loose areolation, characters that place it near the var. *cæspitosa*, but it differs from the latter by its stems provided with much more numerous fasciculate branches. On the other hand, it is closely connected with the form that Kindberg named *P. acutiflora*, but in the latter the stem-leaves are strongly revolute. Number 1812 of Trelease, as well as the specimens from Kukak Bay and St. Paul Island, constitute a heterophyllous deformation, with upper leaves often obtuse or subobtuse. The var. *serrata* Kindb. (Attu Island, teste Macoun) does not appear to be distinguishable from the type.

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Philonotis fontana cæspitosa Sch. Syn., ed. 2, p. 520.

Yakutat Bay (Trelease, 1819).

Philonotis capillaris Lindb. in Hedwigia, 1867, p. 40.

From Kodiak (Trelease, 1841). New to Alaska.

This sterile specimen has, it is true, the aspect, size and areolation of the European *P. capillaris*, but it differs from it by the leaves revolute on the borders from the base for two-thirds of their length. However, it seems impossible to ascribe it to another species. Moreover, according to Mr. Dixon (Handbook, p. 297), *P. capillaris* may have the leaves more or less revolute; this character would then be only more marked on the plant from Kodiak.

Kindberg has indicated from Alaska *P. vancouveriensis* Kindb. and *P. seriata* Mitt.

Family MEESEACEÆ.

Meesea uliginosa Hedw., Descr., I, p. 1, pl. 1, 2.

From Port Wells (Trelease, 2284, 2287); Popof Island (Saunders, without number); St. Matthew Island (Trelease, 1857, 2142).

Meesea tschuctschica C. Müll. in Bot. Centralbl., 1883, nos. 41–43.

(Pl. XXIII, fig. 3^{a-c}.)

From St. Matthew Island (Trelease, 1893 in part). New to Alaska.

This specimen agrees exactly with a scrap of the type kindly communicated by the Royal botanical museum of Berlin, but in the latter the leaves are more crowded, giving to the plant a still more robust aspect. *M. tschutschica* differs from *M. triquetra* Angstr. by its larger size and broader leaf-cells.

Paludella squarrosa Brid., Spec. musc., III, p. 74.

From St. Matthew Island (Trelease, 1893 in part).

Family BRYACEÆ.

Leptobryum pyriforme Sch., Coroll., p. 64.

From Alaska, sine loco (A. Kellogg); Orca (Trelease, 2254, 2257); Bering Island (J. M. Macoun).

Webera cruda Bruch in Hüb. Musc. germ., p. 425.

From Juneau (Coville and Kearney, 578); White Pass, 3,000 ft. (Trelease, 2311, 2312); Orca (Trelease, 1840); Kodiak (Trelease, 2201); Unalaska (J. M. Macoun); St. Paul Island (J. M. Macoun).

Webera nutans Hedw. Descr., I, p. 9, pl. 4.

From Juneau (Trelease, 2182; Brewer and Coe, 696); Port Clarence (Trelease, 2105); Cape Fox (Trelease, 2378); New Metlakatla (Trelease, 2241); Yakutat Bay (Trelease, 2318, 2333); Orca (Tre-

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lease, 2244); Sitka (Trelease, 2354, 2372); Kodiak (Trelease, 2208, 2223); Hall Island (Trelease, 2141); Douglas Island (Trelease, 2390, 2395, 2396, 2390, 2403); St. Lawrence Island (Trelease, 2122, 2123); St. Matthew Island (Coville and Kearney, 2124); Plover Bay, Siberia (Trelease, 2533, 2534, 2538; Brewer and Coe, 668; J. M. Macoun; L. J. Cole).

Webera nutans cæspitosa Hüb., Musc. germ., p. 429.

From Virgin Bay (Trelease, 2307); Kodiak (Trelease, 2188); Douglas Island (Trelease, 2397, 2399, 2412).

Webera nutans bicolor Hüb., loc. cit.

From St. Paul Island (Trelease, 2061); St. George Island (J. M. Macoun).

Webera nutans strangulata Sch. Coroll., p. 66.

From Yakutat Bay (Trelease, 2320).

Webera cucullata Sch. Coroll., p. 66.

From Egg Island in Disenchantment Bay (Coville and Kearney, 1016 in part); Port Wells (Trelease, 2269); St. Paul Island (J. M. Macoun).

WEBERA PSEUDOGRACILIS sp. nov.

(Pl. XVII, fig. 2^{a-g}.)

Dioica, laxe cespitosa, lutescenti-viridis. Caulis brevis, 4–5 millim. altus, simplex vel parce divisus. Folia æqualiter conferta, parva, sicca imbricata, madida erecto-patentia, 1–1.5 millim. longa, 0.4–0.6 lata, nec carinata, nec decurrentia, inferiora breviter ovata vel ovato-lanceolata, superiora lineari-lanceolata, acuta, apice denticulata, marginibus e basi usque ad ⅔ leniter reflexis, costa sat valida, 56 μ basi crassa, percurrente vel subpercurrente, demum rubente, rete denso, cellulis inferioribus rectangulis, rubellis, mediis linearibus, 48–64 μ longis, 8 μ latis, superioribus anguste linearibus, flexuosis, parietibus valde incrassatis, marginalibus angustioribus longioribusque. Folia perichætialia caulinis minora. Capsula in pedicello flexuoso, rubello, circa 2 centim. longo pendula, pallida, obovata, cum operculo convexo, mamillato, 3 millim. longa. Flos masculus terminalis subdiscoideus. Cætera ignota.

From Muir Glacier (Trelease, 2419, 2425, 2427, 2428, 2463.)

Aspect of *Webera gracilis* De Not., but the areolation is different and much closer; it is distinguished, on the other hand, from *Webera drummondii* Lesq. & Jam. by its leaves which are more crowded on the whole stem, and not carinate-concave, and its capsule hanging and with a mamillary lid.

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Webera annotina Bruch in Hüb. Muscol. germ., p. 431.

From New Metlakatla (Coville and Kearney, 370); Kodiak (Trelease, 2222); Unalaska (Trelease, 2300); Hall Island (Trelease, 2140). New to Alaska.

Webera proligera Kindb. Enum. br. dovr., Append., no. 309.

From Kodiak (Trelease, 2221).

This species has also recently been discovered in the Yukon territory by R. S. Williams, and in Minnesota by J. M. Holzinger.

Webera albicans Sch. Coroll., p. 67.

From Juneau (Trelease, 2172); Port Etches (J. M. Macoun); Sitka (Trelease, 1810); Muir Glacier (Trelease, 1783 in part, 2433, 2440, 2458; Coville and Kearney, 637 in part); Yakutat Bay (Trelease, 1822 in part).

Webera albicans glacialis Sch. loc. cit.

From Juneau (Coville and Kearney, 580); Hidden Glacier Inlet, Yakutat Bay (Trelease, 1813, 1817); Hall Island (Treloase, 1883 in part).

The following species have been recorded from Alaska and the islands of Bering Sea: *W. polymorpha* Sch., *W. crudoides* Sull. & Lesq., *W. cucullatiformis* Kindb., *W. drummondii* Lesq. & Jam.

Genus **BRYUM.**[1]

Subgenus CLADODIUM Sch.

BRYUM ATELEOSTOMUM Philibert sp. nov.

(Pl. XIX, fig. 1*a–f*.)

Polygamum, viride, densissime cespitosum, radiculis numerosis arcte intertextum. Caulis ramosus, 1–1.5 centim. altus. Folia erecto-imbricata, ad extremitatem caulis et ramorum in comam congesta, 1.2–1.4 millim. longa, 0.5 lata, ovato-lanceolata, costa excurrente cuspidata, basi haud decurrentia, marginibus limbatis integris, nunc planis, nunc plus minus longe revolutis, costa tenui, 50–55 μ basi crassa, rete densiusculo, cellulis inferioribus quadratis vel rectangulis, 25–50 μ longis, 20–25 latis, cæteris oblongo- vel ovato-hexagonis, 28–45 μ longis, 12–13 latis. Capsula in pedicello rubello breviusculo, circa 1.5 centim. longo, nutans vel pendula, ovata, collo brevi instructa, 2 millim. longa, operculo depresse convexo, mamillato. Exostomii dentes pallide lutei, concolores, articulis 20, regularibus. Endostomium vix evolu-

[1] We are indebted to Mons. Philibert for the determinations of nearly all the species of this genus. He has himself described three of the new species in the *Revue bryologique* for 1900 and 1901.

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tum, sæpius e membrana uniformi, tenui, fugaci compositum. Sporæ 18–20 μ crassæ.

From Kukak Bay (Coville and Kearney, 1516).

Bryum stenotrichum C. Müll. in Flora, 1887, p. 219.

From Dyea Valley, Chilkoot and Taiyasanka (Krause brothers, 1882).

Bryum inclinatum Br. eur., fasc. 6–9, p. 17, pl. 3.

From Juneau (Coville and Kearney, 571); Port Wells (Brewer and Coe, 652; Trelease, 2266, 2267); Cape Fox (Trelease, 2381); Yakutat Bay (Trelease, 2319); Disenchantment Bay (Trelease, 2522*a*); Egg Island (Coville and Kearney, 1016); Muir Glacier (Trelease, 2421); Kukak Bay (Coville and Kearney, 1536, 1590, 1602); Kodiak (Brewer and Coe, 656; Trelease, 2184, 2196, 2199, 2200, 2228; J. M. Macoun); Unalaska (B. W. Evermann); Agattu Island (U. S. S. *Albatross* Exped., 26, 30, 33); St. Paul Island (Trelease, 2065, 2068; J. M. Macoun); Hall Island (Coville and Kearney, 2056); Douglas Island (Trelease, 2400); St. Matthew Island (Trelease, 2144; Brewer and Coe, 680); Plover Bay, Siberia (Trelease, 2098, 2540, 2541; J. M. Macoun).

Very numerous forms, of which some are rather doubtful, on account of the imperfect state of the capsules.

BRYUM TRELEASEI Philib. sp. nov.

(Pl. xx, fig. 1^{a-g}.)

From St. Matthew Island (Trelease, 1890 in part, mixed with *Hypnum revolvens*).

We do no more than figure this species and the two following, which have been carefully described by Mons. Philibert, in the *Revue bryologique*, 1901, pp. 33–35, pl. VIII, fig. 1.

BRYUM AGATTUENSE Philib. sp. nov.

(Pl. xx, fig. 2^{a-h}.)

Described in Rev. bryol., 1901, p. 35, pl. VIII, fig. 2.

From Agattu Island (U. S. S. *Albatross* Exped., 24, 27).

BRYUM MUCRONIGERUM Philib. sp. nov.

(Pl. xvii, fig. 3^{a-f}.)

Described in Rev. bryol., 1900, p. 91, pl. V, fig. 3.

From Port Wells (Trelease, 2270; Coville and Kearney, 1296); Cape Fox (Trelease, 2379); St. Paul Island (Trelease, 2063, 2064, 2066).

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Mons. Philibert describes the lid of this species as "convexe, peu saillant et obtus." We have seen it mamillate.

Subgenus EUBRYUM Lindb.

Bryum bimum Schreb. Spic. flor. lips., p. 83.

From Muir Glacier (Trelease, 2460). New to Alaska.

A short form.

Bryum pallescens Schleich. Crypt. exsicc. helv., no. 28.

From Indian Camp in Yakutat Bay (Brewer and Coe, 650); Disenchantment Bay (Brewer and Coe, 633); Hubbard Glacier (Coville and Kearney, 1070); Egg Island (Coville and Kearney, 1085); Muir Glacier (Trelease, 1791, 2420, 2435, 2436, 2439, 2457); Port Wells (Trelease, 2264); Douglas Island (Trelease, 2398); Agattu Island (U. S. S. *Albatross* Exped., 28, 32); St. Matthew Island (Trelease, 2145); St. Paul Island (Coville and Kearney, 1835; Trelease, 2068); Plover Bay, Siberia (Trelease, 2060, 2096, 2535).

Several forms. Some specimens are rather doubtful because of the bad state of the capsules.

BRYUM CYLINDRICO-ARCUATUM Philib. sp. nov.

(Pl. XVIII, fig. 2[a–g].)

Monoicum (fide Philibert), viride, densiuscule cespitosum, radiculis numerosis intertextum. Caulis erectus, 1–2 centim. altus, superne ramos graciles emittens. Folia ad basin caulis et ramorum minuta, remota, superiora majora, in comam congesta, circa 2 millim. longa, 1–1.2 lata, sicca erecta subflexuosa, madida patentia patulave, e basi paululum decurrente ovato- vel oblongo-lanceolata, late breviterque acuminata, mucronata, marginibus integris haud limbatis parce revolutis, costa basi 80 μ crassa superne attenuata breviter excurrente, rete densiusculo, cellulis inferioribus laxioribus rectangulis, 55–85 μ longis, 22 latis, mediis oblongo-hexagonis, long. 28–56 μ, lat. 14, superioribus minoribus brevioribusque. Flos masculus terminalis, 25–30 antheridiis. Capsula in pedicello rubello flexuoso, 2 centim. longo, apice curvato, nutans vel pendula, anguste cylindrica, arcuata, longicollis, operculo obtuse conico. Peristomii dentes longissimi, basi rubri. Endostomium valde perfectum, ciliis appendiculatis. Sporæ leves, diam. 12 μ.

From Kodiak (Trelease, 2186).

Bryum argenteum Linn. Sp. plant., p. 1120.

From Bogoslof volcano (Coville and Kearney, 2614 in part); St. Paul Island (Trelease, 1513, 2090; J. M. Macoun).

Number 2090 is a form near var. *majus* Br. eur.

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BRYUM LAURENTIANUM sp. nov.

(Pl. XIX, fig. 3[a–g].)

Elatum, densissime cespitosum, lutescenti-viride. Caulis 3–4 centim. altus, radiculosus, laxiuscule foliosus, ramis numerosis erectis subclavatis. Folia sicca et madida erecto-imbricata, ovato- vel oblongo-lanceolata, circa 1.5 millim. longa, 0.75 lata, acute acuminata, marginibus planis inferne integris, superne distincte denticulatis, costa valida demum fuscescente, basi 80–100 μ crassa, sensim attenuata et sub apice evanida, cellulis basilaribus rectangulis, mediis superioribusque rectangulis vel oblongo-subhexagonis, long. 40–75 μ, lat. 14–17, marginalibus 4–5 seriatis, longioribus angustioribusque, linearibus, parietibus paululum crassioribus, limbum parum distinctum efformantibus. Cætera ignota.

From St. Lawrence Island (Trelease, 1871).

This species, which seems to belong to the group of *B. alpinum* Huds., is chiefly characterized by its more acuminate and distinctly denticulate leaves, and by its nerve disappearing below the apex.

BRYUM LEPTODICTYON Philib. sp. nov.

(Pl. XVIII, fig. 3[a–f].)

Dioicum, gregarium, pallide vel lutescenti-viride. Caulis erectus, simplex, 4–6 millim. altus. Folia sicca imbricata, madida erecta, inferiora minora, ascendendo majora, anguste lanceolata, sublinearia, sensim longeque acuminata, 1–1.8 millim. longa, 0.35 lata, basi haud decurrente, marginibus planis inferne integris, superne minute denticulatis, costa angusta, basi 55 μ crassa, percurrente, rete perfecte weberaceo, cellulis uniformibus linearibus, mediis 45–60 μ longis, 5–6 latis. Capsula in pedicello rubello flexuoso, 1.5–2 centim. longo, abrupte pendula, oblonga, parva, 2 millim. longa, 0.8–0.9 crassa, pallida, collo brevi attenuata, operculo conico apiculato. Peristomium perfectum, dentibus basi rubris, ciliis appendiculatis. Sporæ leves, diam. 9–12 μ.

From Hidden Glacier in Russell Fiord (Coville and Kearney, 964).

Species very distinct, having quite the facies and areolation of a *Webera* with the peristome of *Bryum*.

BRYUM HETEROGYNUM Philib. sp. nov.

(Pl. XIX, fig. 2[a–g].)

Dioicum. Cespites humiles, intense rubri, ætate vinosi, basi terra obruti. Caulis erectus, radiculosus, ramosus, 5–12 mill. altus. Folia sicca erecta, madida erecto-patentia, ovato-lanceolata, 1.5 millim. longa,

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0.5–0.6 lata, sat longe acuminata costaque excurrente cuspidata, apice parce et acute denticulata, marginibus sæpius limbatis, limbo inferne angusto, plano, superne crassiore, distincto, interdum subreflexo, rarius deficiente, costa angusta, basi 50–55 μ crassa, sensim attenuata, cellulis inferioribus rectangulis, 50–65 μ longis, 17–22 latis, mediis oblongo-hexagonis, 45–55 μ longis, 13 latis, marginalibus angustioribus linearibus. Capsula in pedicello rubello, 2.5–3 centim. longo, nutans vel pendula, ovato-pyriformis, collo attenuato instructa, 3–4 millim. longa, operculo convexo. Exostomii dentes pallide ferruginei. Endostomium perfectum, ciliis appendiculatis. Planta mascula brevis, gemmiformis, cespites distinctos efformans, foliis breviter ovato-cuspidatis.

From Muir Glacier (Trelease, 2426, 2434, 2441, 2461, 2462); Hidden Glacier Inlet in Yakutat Bay (Trelease, 2518).

Bryum acutiusculum C. Müll. in Flora, 1887, p. 220.

From Chilkoot (Krause brothers).

Bryum cæspiticium Linn. Sp. plant., p. 1121.

Alaska, sine loco (Frederick Funston, 26); Muir Glacier, (Trelease, 2427 in part).

Bryum pallens Sw. Musc. suec., pp. 47, 98, pl. 4, f. 12.

From head of Russell Fiord (Coville and Kearney, 960); Disenchantment Bay (Trelease, 2522; forma *rubro-vinosa*). New to Alaska.

BRYUM PSEUDOSTIRTONI Philib. sp. nov.

(Pl. XVIII, fig. 4[a–g]).

Sæpe synoicum, dense cespitosum, sordide vel lutescenti-viride. Caulis elongatus, filiformis, parce ramosus, 2.5–4 centim. altus. Folia mollia, laxiuscula, sicca erecto-imbricata, madida erecto-patentia, caulina ovato-lanceolata, acuminata costaque longe excurrente cuspidata, 2 millim. longa, 0.7 lata, marginibus integris planis vel subreflexis, costa angusta, 60–70 μ basi lata, rete laxo, cellulis inferioribus rectangulis, mediis superioribusque ovato-hexagonis, long. 28–50 μ, lat. 14–17, marginalibus angustioribus. Folia ramea minora, inferiora ovata, subobtusa vel breviter cuspidata. Capsula in pedicello gracili, 1.5 centim. longo, nutans vel pendula, oblonga, parva, 2 millim. longa, collo brevi attenuata, sicca sub or econstricta, operculo conico-mamillato. Exostomii dentes pallidi, basi rubri. Endostomium perfectum, ciliis nunc longe appendiculatis, nunc simplicibus. Sporæ 12–18 μ crassæ.

From Muir Glacier (Trelease, 2448, 2459).

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BRYUM HARRIMANI sp. nov.

(Pl. xxi, fig. 1[e–g]).

Sat robustum, densiuscule cespitosum, lutescenti-viride. Caulis erectus, 3–4 centim. altus, fragilis, radiculosus, laxe foliosus, ramosus, ramis erectis, obtusis. Folia mollia, sicca erecto-patentia, madida patula, 1.2–1.6 millim. longa, 0.8–0.9 lata, basi paululum decurrentia, integra, margine plana vel subreflexa, dimorpha, inferiora ovato-lanceolata, acuta, superiora et ramulina late ovata, valde concava, apice obtuso cucullato, costa tenui, 40–45 μ basi crassa, in foliis inferioribus acutis percurrente vel breviter excurrente, in superioribus obtusis sub apice evanida, rete laxissimo, parce chlorophylloso, cellulis inferioribus quadratis vel breviter rectangulis, long. 40–50 μ, lat. 25–35, cæteris ovato-hexagonis, marginalibus linearibus 1–2 seriatis. Cætera ignota.

From Yakutat Bay (Trelease, 1793); Hidden Glacier Inlet (Trelease, 1784 in part, 1815).

This moss can be placed near *B. obtusifolium* Lindb. from which it is easily distinguished by its dimorphous leaves, plane on the borders, and of a looser texture.

Bryum pseudotriquetrum Schw. Suppl., I, II, p. 110.

From Muir Glacier (Trelease, 1806, 2435*a*); Kodiak (Trelease, 1848*a*, 1850); Unalaska (Trelease, 2299); St. Paul Island (Trelease, 2068).

Bryum duvalii Voit, in Sturm, Deutsch. fl., II, Heft 12.

From Yakutat Bay (Trelease, 1817 in part, 1822 in part); Port Wells (Trelease, 2285); Kodiak (Trelease, 1842, 1846).

BRYUM DUVALII OBTUSATUM var. nov.

A forma typica differt foliis obtusis, apice cucullato denticulato, basi paululum minus decurrentibus.

From Disenchantment Bay (Trelease, 2517).

BRYUM DREPANOCARPUM Philib. sp. nov.

(Pl. xvii, fig. 1[a–h].)

Ut videtur dioicum, laxiuscule cespitosum, fusco-viride vel rubro-vinosum. Caulis erectus, 1–2 centim. altus, inferne radiculosus, superne ramosus, ramis erectis, numerosis, gracilibus. Folia sicca erecto-flexuosa, madida erecto-patentia, circa 2 millim. longa, 0.9 lata, e basi haud vel parum decurrente oblongo-lanceolata, acuminata, acuta vel costa excurrente brevissime cuspidata, mariginibus integris, reflexis, anguste limbatis, costa tenui, attenuata, in foliis inferioribus percurrente, in superioribus breviter excedente, rete parce

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chlorophylloso, cellulis mediis subrectangularibus vel oblongo-hexagonis, long. 47–70 μ, lat. 16–22. Capsula in pedicello rubello, 1.5–2 cent. longo, nutans vel inclinata, ætate fusca, oblonga, collo longo attenuata, falcato-curvata, matura orificio dilatata, operculo conico. Peristomium perfectum; exostomii dentes basi rubri; endostomii membrana elata, ciliis appendiculatis.

From Juneau (Canby, 485; Coville and Kearney, 579); Disenchantment Bay (Trelease, 2515).

This species, which offers many points of resemblance to *B. meeseoides* Kindb., differs from it by the peristomial teeth which are firmer, stiffer, more scabrous and reddish at the base, the segments more acuminate and perforate from more irregular openings, and the higher membrane.

Subgenus ANOMOBRYUM Sch.

Bryum bullatum C. Müll. in Flora, 1887, p. 221.

From Takhin valley (Krause brothers).

Other species of the genus *Bryum* which have been recorded from Alaska and the islands of Bering Sea are the following: *B. alaskanum* Kindb., *B. brachyneuron* Kindb., *B. capillare* Linn., *B. erythrophyllum* Kindb., *B. fallax* Milde, *B. froudei* Kindb., *B. lacustre* Brid., *B. meeseoides* Kindb., *B. microstegioides* Kindb., *B. obtusifolium* Lindb., *B. pendulum* Sch., *B. wrightii* Sulliv.

Quite recently, the late Mr. Philibert has described in the Revue Bryologique, 1901, fasc. 2, two other new species, *B. submuticum* and *B. suborbiculare*, collected in the vicinity of Dawson by Mr. R. S. Williams.

Family MNIACEÆ.

Mnium medium Br. eur., fasc. 5, p. 32, pl. 10.

From Yakutat Bay (Trelease, 1720, 1721 in part); Disenchantment Bay (Trelease, 1718, 1719*a*; Coville and Kearney, 1075); Point Gustavus (Coville and Kearney, 785).

Mnium affine Bland. Musc. frond. exsic., fasc. III, no. 133. Schw. Suppl., I, II, p. 134.

From Muir Glacier (Trelease, 1713); Kodiak (Trelease, 1725*b*); Agattu Island (U. S. S. *Albatross* Exped., 38).

Mnium affine elatum Br. eur., fasc. 5, p. 30, in part.

From Kodiak (Trelease, 1726); St. Paul Island (Trelease, 2093; a stunted form).

Mnium rugicum Laur. in Flora, 1827, p. 292.

From Kodiak (Trelease, 1725*a*); Plover Bay, Siberia (Trelease, 2100).

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Mnium insigne Mitt. in Hook. Journ. of bot., 1856, p. 230.

From Alaska, sine loco (Evans, 1897); Wrangell (Trelease, 1711); Cape Fox (Trelease, 2380); Sitka (Trelease, 1714*b*, 1716); St. Paul Island (Trelease, 2069). New to Alaska.

Mnium spinulosum Br. eur., fasc. 31, Suppl. p. 4, pl. 4.

From Skagway (Canby, 480).

Mnium punctatum elatum Sch. Syn., ed. 1, p. 398.

From Port Wells (Trelease, 1723, 1724; Coville and Kearney, 1294); Indian camp, Yakutat Bay (Brewer and Coe, 642 in part); Disenchantment Bay (Trelease, 1717); Cape Karluk (Brewer and Coe, 687); Sitka (Trelease, 1715. in part); Kodiak (Trelease, 1725); St. George Island (C. Hart Merriam in 1891).

MNIUM PUNCTATUM ANCEPS var. nov.

A forma typica differt foliis sæpe cucullatis cellulisque superioribus multo minoribus, fere isodiametricis ut in *M. glabrescente*, sed ab illo limbo haud incrassato distincta.

From Unalaska (Trelease, 1727).

Mnium nudum Williams in Bryologist, 1900, p. 6.

From Yakutat Bay (Trelease, 1721). New to Alaska.

This specimen agrees exactly with *M. nudum* Williams, from Idaho and Montana. Mr. Williams mentions as distinctive characters for his species, in comparison with *M. punctatum*, nothing but the unthickened margin of the leaf and the naked, not radiculose stems. Now, in the European specimens of *M. punctatum* var. *elatum*, it very often happens that the margin of the leaf is not thickened at all or only slightly towards the base; this character, therefore, is not valuable. But, besides the naked or hardly radiculose stems and the smaller height, *M. nudum* differs from *M. punctatum* var. *elatum* by a more regularly hexagonal areolation, the cells towards the margins being larger (45–55 μ instead of 28–35) and the ones near the costa of the same length as in the allied species (70–100 μ) but broader (50–60 μ, instead of 40–45); and the lid of *M. nudum* is shortly apiculate, while in *M. punctatum* it is rather long beaked. However, these distinctive characters are not of great importance, and it seems to us preferable to regard *M. nudum* as a subspecies of *M. punctatum*.

Mnium glabrescens Kindb. Notes on Canad. bryol., 1893.

From Alaska, sine loco (W. H. Evans, 1897); Farragut Bay (Trelease, 1712, 2417; Brewer and Coe, 611, 614); Orca (Trelease, 1722, 2248; Setchell, 1200); Port Wells (Trelease, 2265); Sitka

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(Trelease, 1714, 1715; Canby, 461; Setchell, 1254; W. G. Wright, 1604); Prince of Wales Island (J. M. Macoun); St. George Island (J. M. Macoun); Yes Bay (Gorman, 184 in part); Wood Island (Brewer and Coe, 664).

This species is distinguished from *M. punctatum* by its cells which are nearly isodiametric and much smaller, by its larger and thicker margo, the axile fascicle of the nerve, which is colored in red and forms a line generally very distinct, the larger spores (44–55 μ, instead of 30–40) and the higher peristome (0.75 millim., instead of 0.60). Moreover the nerve is usually shorter than in *M. punctatum*.

Mnium subglobosum Br. eur., fasc. 31, Suppl., p. 3, pl. 3.

From Disenchantment Bay (Trelease, 1719); Port Wells (Coville and Kearney, 1293); St. Paul Island (J. M. Macoun).

Mnium cinclidioides Hüb. Muscol. germ., p. 416.

From Douglas Island (Trelease, 2410; a small form).

Leucolepis acanthoneura Lindb. Mniac. europ., p. 80.

From Alaska, sine loco (W. H. Evans, 1897); Sitka (J. M. Macoun).

Aulacomnium palustre Schw. Suppl., III, 1, 1, pl. CCXVI.

From Muir Glacier (Trelease, 1896); Wrangell (Trelease, 1907); Port Clarence (Trelease, 1900, 1901); Kodiak (Trelease, 1845, 1851, 1898, 1919, 1924); Popof Island (Saunders, 1858); St. Matthew Island (Trelease, 1905); St. Lawrence Island (Trelease, 1903); Plover Bay, Siberia (Trelease, 2547).

Aulacomnium turgidum Schw. Suppl., III, 1, 1.

From Port Clarence (Trelease, 1986); St. Matthew Island (Trelease, 1887 in part, 1904); St. Paul Island (J. M. Macoun).

Aulacomnium androgynum Schw. Suppl., III, 1, 1, pl. CCXV.

From Sitka (Trelease, 2371); Kodiak (Trelease, 2185). New to Alaska.

Timmia austriaca Hedw. Spec. musc., p. 176, pl. XLII, f. 1–7.

From White Pass (Trelease, 2310 in part).

A sterile and stunted form, with short leaves.

Family POLYTRICHACEÆ.

BARTRAMIOPSIS LESCURII Card. & Thér. not Kindb.

(Pl. XXI, fig. 2[e–i].)

Atrichum lescurii JAMES, Manual, p. 257.
Bartramiopsis sitkana KINDB. (ut subsp.) in Rev. bryol., 1894, p. 35.

From Virgin Bay (Trelease, 1733); Orca (Trelease, 1731); Douglas Island (Trelease, 1729, 1730).

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The moss which was described by Mr. Kindberg under the name of *B. lescurii*, from sterile specimens collected in Japan, does not seem to be the true *Atrichum lescurii* James, because its leaves are only incurvate and not crispate when dry. On the contrary, it is probable that *B. sitkana* of Kindberg, equally described from sterile specimens, differs in nothing from the species of James. The latter was, after all, imperfectly known until now, the author having seen neither the calyptra nor the lid, and having been unable to ascertain the existence or absence of a peristome. Therefore, we here give a complete description with drawings of this interesting moss, which, by the absence of the peristome and chiefly by the structure of its leaves, which, except on the borders, consist of two layers of cells, seems to us to constitute a genus distinct from *Atrichum*.[1]

Dioicum, laxe cespitosum, atroviride. Caulis gracillimus, filiformis, flexuosus, simplex furcatusve, laxe foliosus, inferne longissime denudatus, 2–8 cent. altus. Folia sicca crispatissima, madida arcuato-patula, 4 millim. longa, basi subvaginantia, lineari-lanceolata, acuminata, marginibus basis inferne integris, superne utroque latere 3–5 ciliis longis ornatis, marginibus laminæ planis valde serratis, haud limbatis, costa lata, dorso levi, ventro lamellosa, lamellis 5–8, margine dentatis, in sectione transversali e 6–8 seriebus cellularum formatis; cellulis basilaribus areolationis rectangulis, hyalinis, 4–6 long. quam lat., rete laminæ opaco, cellulis minutis hexagonis (diam. 8 μ), bistratosis, tantum ad margines unistratosis ibique limbum translucentem fingentibus. Capsula in pedicello rubello brevi, 8–12 millim. longo, erecta, primum breviter ovato-cylindrica, ætate turbinata, gymnostoma, ore valde dilatato, epiphragmate columellæ adhærente clauso, operculo alte conico, longe acuminato, capsulam fere æquante. Calyptra nuda, glabra, breviter acuminata, operculum tantum obtegens. Sporæ ovatæ vel subtrigonæ, diam. 12–16 μ.

Atrichum parallelum Mitt. in Journ. Linn. Soc., VIII, p. 48, pl. 8.

A. leiophyllum KINDB. in Bull. Torr. Bot. Club, XVII, p. 275.

From Douglas Island (Trelease, 1728, 2415); Port Etches (J. M. Macoun).

A. leiophyllum Kindb. cannot be specifically distinguished from *A. parallelum* Mitt., the characters put forward by Mr. Kindberg to justify the creation of his species being liable to vary on the same specimen. Such is more particularly the case with number 217 of the *Canadian Musci*, the leaves of which are sometimes destitute of dentate crests on the back and sometimes possess them well-developed.

[1] See Note 2, p. 347.

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On other specimens, coming from Vancouver Island, the crests are more generally wanting; however, they are sometimes found and the leaves often bear sparse teeth on the back toward the apex; moreover, the nerve is always lamelliferous on both sides, at least in the upper part.

Oligotrichum aligerum Mitt. in Journ. Linn. Soc., VIII, p. 48, pl. 8.

From Kodiak (Brewer and Coe, 658).

Oligotrichum integrifolium Kindb. in Rev. bryol., 1894, p. 40.

O. hercynicum var. *latifolium* C. MÜLL. & KINDB. in Macoun, Cat. Can. pl., VI, Musci, p. 149.

From St. Lawrence Island (J. M. Macoun). New to Alaska.

Mr. Kindberg has attributed this moss to *O. hercynicum* typicum, but it certainly belongs to his *O. integrifolium*, characterized by its broader leaves, smooth and entire on the back, and by the cells of the leaf-areolation which are much larger; characters which appear to us sufficient to admit of a specific distinction.

Psilopilum arcticum Brid. Bryol. univ., II, p. 95.

From Port Clarence (Trelease, 2113, 2114, 2526); St. Paul Island (J. M. Macoun); St. Matthew Island (Coville and Kearney, 2125).

The specimens from St. Matthew Island have their stem-leaves a little longer than those of the European specimens, their basilar cells with thicker walls and their perichætial leaves hardly different from the comal ones, and thus almost exactly agree with *Catharinea* (*Psilopilum*) *tschuctschica* C. Müll., which does not appear to us a good species.

Pogonatum capillare dentatum Lindb. in Act. Soc. Sc. Fenn., 1872, p. 266.

Polytrichum dentatum MENZ. in Trans. of the Linn. Soc., IV, p. 80, pl. 7, f. 4.

From Juneau (Trelease, 1656; Brewer and Coe, 691*a*, 693, 695; Coville and Kearney, 583; Setchell, 1230; Canby, 435, 436 in part); Port Wells (Trelease, 1654); Kodiak (Trelease, 1653); Douglas Island (Trelease, 1657); St. Paul Island (J. M. Macoun).

Pogonatum dentatum (Menz.) Brid. is but a western race of *P. capillare*, characterized by having slenderer stems than those of the type, and by its pedicel which is not usually so flexuous.

Pogonatum contortum Lesq. in Mem. Calif. Acad. I, p. 27.

P. erythrodontium Kindb. in Macoun, Cat. Can. pl., VI, Musci, p. 150.[1]

[1] As regards this synonymy, see Cardot, Étude sur la flore bryologique de l'Amérique du Nord. Revision des types d'Hedwig et de Schwægrichen; in Bull. de l'herb. Boissier, VII, pp. 366–368.

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From Juneau (Canby, 436 in part); Wrangell (Trelease, 1652); Orca (Trelease, 1732; Coville and Kearney, 1306 in part); Kodiak (Trelease, 1847); Prince of Wales Island (J. M. Macoun); Yes Bay (Gorman, 182, with a slender, elongated male form of *Dicranella heteromalla*).

Pogonatum urnigerum Pal. Beauv. Prodr., p. 84.

From Hidden Glacier Inlet, Yakutat Bay (Trelease, without number); Disenchantment Bay (Trelease, 1655); Hubbard Glacier (Coville and Kearney, 1072); Muir Glacier (Trelease, 1660).

Pogonatum alpinum Rœhl. in Ann. Wett. Ges., III, p. 226.

From Alaska, sine loco (W. H. Evans in 1897); Juneau (Canby, without number; Trelease, 1680; Coville and Kearney, 560, 581); Yakutat Bay (Trelease, 1688; Brewer and Coe, 648); Point Gustavus (Coville and Kearney, 792); Port Wells (Trelease, 1658, 1690); Orca (Trelease, 1691, 1692); Kukak Bay (Coville and Kearney, 1605); Sitka (Trelease, 1685); Kodiak (Trelease, 1695); Douglas Island (Trelease, 1683*b*); Unalaska (J. M. Macoun); Attu Island (L. M. Turner); Kiska Island (U. S. S. *Albatross* Exped., 9); St. Paul Island (J. M. Macoun; L. J. Cole; Trelease, 1661, 1699; Coville and Kearney, 1821); Hall Island (Trelease, 1663; Brewer and Coe, 675); Plover Bay, Siberia (Trelease, 2545; Coville and Kearney, 1860).

Numerous forms, many of which pass to var. *macounii*.

POGONATUM ALPINUM MACOUNII var. nov.

P. macounii KINDB. in Bull. Torr. Bot. Club, XVI, p. 96.

From Alaska, sine loco (W. H. Evans in 1897); Juneau (Setchell, 1237); Foggy Bay, near Cape Fox (Coville and Kearney, 2573); Prince of Wales Island (J. M. Macoun); Sitka (W. G. Wright, 1603).

No precise limits exist between *P. alpinum* and *P. macounii*. Kindberg attributes 60 lamellæ to the leaves of his species, but on the specimens which he sent to us we find only from 40 to 50 lamellæ; and, on the other hand, *P. alpinum*, to which he attributes only 30 lamellæ, often has 40. (Cfr. Barclay, Muscinées de la France, p. 198, and Limpricht, Laubmoose, II, p. 615.) There is no other more constant difference between the two mosses. *P. macounii* is therefore only a variety of *P. alpinum*, characterized by its greater dimensions, its longer leaves, more widely spreading when dry and usually provided with more numerous lamellæ (40 to 50). This var. *macounii* represents an extreme form of *P. alpinum*, of which the

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other extreme is var. *brevifolium*. In the specimens from Alaska we find all gradations of form between the two varieties.

Pogonatum alpinum septentrionale Brid. Bryol. univ., II, p. 131.

From Kodiak (Trelease, 1676); St. Paul Island (J. M. Macoun).

Pogonatum alpinum arcticum Brid. Bryol. univ., II, p. 131.

From Egg Island, Disenchantment Bay (Coville and Kearney, 1006).

Pogonatum alpinum brevifolium Brid. Bryol. univ., II, p. 131.

From St. Paul Island (Trelease, 1661 in part); St. Lawrence Island (Trelease, 1664); St. Matthew Island (Trelease, 1662); Plover Bay, Siberia (Trelease, 1670; Brewer and Coe, 667).

Pogonatum alpinum simplex Sch. Syn., ed. 2, p. 539.

From Port Clarence (Trelease, 1665). New to Alaska.

P. atrovirens Mitt. has been recorded from Alaska by Kindberg. *P. microdontium* Kindb., from St. Paul Island, seems to us not distinct from *P. alpinum* var. *septentrionale*.

Polytrichum formosum Hedw. Spec. musc., p. 92, pl. 19, figs. 1, *a*.

From Alaska, sine loco (W. H. Evans in 1897); Juneau (Trelease, 1681; Canby, 429); New Metlakatla (Trelease, 1678*a*, 1679); Wrangell (Trelease, 1679 bis; Canby, 434); Farragut Bay (Brewer and Coe, 610); Orca (Coville and Kearney, 1306; Setchell, 1204); Virgin Bay (Trelease, 1689); Sitka (Trelease, 1684, 1687; Coville and Kearney, 811); Hot Springs (Trelease, 1686); Kodiak (Trelease, 1694); Douglas Island (Trelease, 1682, 1683).

Polytrichum gracile Dicks. Menz. in Trans. Linn. Soc., IV, p. 73, pl. 6, fig. 3.

From Kodiak (Trelease, 1675). New to Alaska.

Polytrichum commune Linn. Spec. pl., II, p. 1109.

From Alaska, sine loco (W. H. Evans in 1897); between Cook Inlet and the Tanana River (Capt. E. F. Glenn in 1899); Kodiak (Trelease, 1693; L. J. Cole).

POLYTRICHUM YUKONENSE sp. nov.

(Pl. XXII, fig. 1*e–f*.)

Caulis 5–8 centim. altus, simplex vel parcissime ramosus, inferne longe denudatus, basi tomento albido obtectus. Folia rigida, sicca suberecta, madida erecto-patentia, 4–6 millim. longa, 1 lata, e basi appressa subvaginante lutescente breviter lineari-acuminata, in cuspidem fuscam integram attenuata, marginibus erectis integris, lamellis circiter 30, elatis, margine crenulatis, in sectione transversali e 8–12 cellulis

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compositis, cellula apicali majore, profunde emarginata. Cætera ignota.

From Yukon River (W. H. Dall, in 1867).

This species is easily distinguished from the smaller forms of *P. commune* by its short and entire leaves, its higher lamellæ with more deeply crenated borders and more strongly emarginated marginal cells.

A recently described species, *P. jensenii* Hagen (*P. fragilifolium* Lindb. fil. mss.), which has been found in Greenland, Spitzbergen, Lapland and Wyoming, comes very near our *P. yukonense* by its size and the height and structure of its lamellæ, but differs from it by its leaves being longer and dentate at the point, by the cells of the basilar and subvaginant part, which are wider, and by the much less emarginated apical cells of the lamellæ.

Polytrichum juniperinum Willd. Fl. berol. prodr., p. 305.

From New Metlakatla (Trelease, 1678*b*); Point Gustavus (Coville and Kearney, 772 in part); Kodiak (Trelease, 1674, 1696); Long Island (Trelease, 1697); Port Clarence (Trelease, 1666, 1667, 1668; Brewer and Coe, 670; L. J. Cole).

Numbers 1667, 1668 of Trelease, and 670 of Brewer and Coe constitute a form near var. *alpinum* Sch.

Polytrichum strictum Banks apud. Menz. in Trans. Linn. Soc., IV, p. 77, pl. 7, f. 1.

From New Metlakatla (Trelease, 1659); Wrangell (Coville and Kearney, 414); Virgin Bay (Trelease, 1672, 1673; Coville and Kearney, 1237); Sitka (Trelease, 1671, 1687; Coville and Kearney, 893); Kodiak (Trelease, 1675).

Polytrichum hyperboreum R. Brown in Parry voyage, Suppl., p. 294. *P. boreale* KINDB. in Mac. Cat. Can. pl., VI, Musci, p. 155.

From St. Paul Island (J. M. Macoun); Plover Bay, Siberia (Coville and Kearney, 1860 in part).

It is impossible to distinguish from *P. hyperboreum* R. Br. the *P. boreale* of Kindberg, the characters mentioned by the author for the latter having no stability, even on the original specimens he has communicated to us.

P. sexangulare Fl., *P. piliferum* Schreb. and *P. bekringianum* Kindb. have been reported by Kindberg from Alaska and the islands of Bering Sea.

Family FONTINALACEÆ.

Fontinalis patula Card. in Rev. bryol., 1896, p. 67.

From Sitka (Trelease, 2368). New to Alaska.

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Family NECKERACEÆ.

Neckera pennata Hedw. Descr., III, p. 17, pl. 19.

From Skagway (Canby, 428).

N. menziesii Drumm., *N. douglasii* Hook. and *Alsia abietina* Sulliv., have been recorded from Alaska by Mr. Kindberg.

Family LEUCODONTACEÆ.

Antitrichia curtipendula Brid. Mant. musc., p. 136.

From Wrangell (Trelease, 1992; Coville and Kearney, 404); Cape Fox (Trelease, 1964*a*, 2012); Yakutat Bay (Trelease, 1821 in part, 1916); Orca (Trelease, 2010); Kodiak (Trelease, 1920 in part); Unalaska (Trelease, 1983; J. M. Macoun); Popof Island (Saunders, 2293); Mist harbor, Nagai Island (U. S. S. *Albatross* Exped.).

Antitrichia curtipendula gigantea Sulliv. Lesq. Musci bor. amer. exsicc., ed. 2, no. 356. Sch. Syn., ed. 2, p. 577.

From Yakutat Bay (Trelease, 1917); Point Gustavus (Coville and Kearney, 572); Cape Fox (Trelease, 1964); Hot Springs (Trelease, 2003); Kodiak (Trelease, 1922, 1931); Popof Island (Saunders, 2037); Unalaska (Trelease, 1984).

This variety is not always larger than the type; it is specially characterized by its nerve being provided at the base with longer and more numerous fascicles (5–8 instead of 2–4); but doubtful forms are frequent.

A. californica Sulliv. has, teste Rothrock, been reported from Alaska by Kindberg.

Family HOOKERIACEÆ.

Pterygophyllum lucens Brid. Mant. musc., p. 149.

Sine loco (Brewer and Coe, 622). New to Alaska, if not collected in British Columbia.

Family LESKEACEÆ.

Myurella julacea Br. eur., fasc. 46–47, p. 3, pl. 1.

From Port Wells (Trelease, 2286 in part).

Myurella julacea scabrifolia Lindb. Musc. scand., p. 37.

From Port Wells (Trelease, 1832 in part). New to Alaska.

Family ISOTHECIACEÆ.

Climacium dendroides Web. & Mohr, Reise in Schwed., p. 96.

From Alaska sine loco (U. S. S. *Albatross* Exped.); Disenchantment Bay (Trelease, 1703); Muir Glacier (Trelease, 1701); Head of Russell Fiord (Coville and Kearney, 949); Kodiak (Trelease,

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1706); Hall Island (Trelease 1707); St. Paul Island (J. M. Macoun).

The specimens from St. Paul Island are remarkable by their leaves being entire or nearly so, and provided with rounded auricles, larger than in the type. In *C. americanum* Brid., the auricles are still more developed, and the areolation is chiefly formed of much shorter and wider cells. By its entire or subentire leaves, the form from St. Paul Island comes near var. *oregonense* Ren. & Card.

Climacium ruthenicum Lindb. Act. Soc. Fenn., x, p. 248.

From Juneau (Setchell, 1231; Coville and Kearney, 599); Yakutat Bay (Trelease, 1704); Virgin Bay (Trelease, 1705); Port Etches (J. M. Macoun); Sitka (Trelease, 1702; Canby, 407).

Orthothecium intricatum Br. eur., fasc. 48, p. 4, pl. 2, 3.

From Bailey Harbor (U. S. S. *Albatross* Exped., 1893). New to Alaska.

A small form mixed with *Claopodium bolanderi* Best.

Orthothecium chryseum Br. eur., fasc. 48, p. 3, pl. 2.

From Port Wells (Trelease, 1897).

Family THUIDIACEÆ.

Pseudoleskea atrovirens Br. eur., fasc. 49–51, p. 2, pl. 1.

From Yakutat Bay (Trelease, 1746*a*). New to Alaska.

Pseudoleskea radicosa Best in Bull. Torr. Bot. Club, XXVII, p. 230.

P. rigescens REN. & CARD. Musci Am. sept. exsicc., no. 93.

From Muir Glacier (Trelease, 1911).

A slender and somewhat etiolated form.

Pseudoleskea stenophylla Ren. & Card. in Bot. Centralbl., 1890, no. 51, p. 421.

P. rigescens BEST, loc. cit., p. 232.

Lescuræa imperfecta C. MÜLL. & KINDB. in Mac. Cat. Can. pl., VI, Musci, p. 170, fide Best.

From Yakutat Bay (Trelease, 1759, 2056); Muir Glacier (Trelease, 1782, 2442, 2452, 2453); Point Gustavus (Coville and Kearney, 753 in part). New to Alaska.

Numbers 2056 of Trelease, and 753 in part of Coville and Kearney, exactly agree with the type of Washington; the Muir Glacier plant has the leaves somewhat wider at the base, but the form of the segments of the endostome and the other characters leave no doubt as to its correct reference to *P. stenophylla*. Number 1759, from Yakutat Bay, is a stouter and sterile form, the determination of which is rather doubtful.

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In his valuable *Revision of the North American species of Pseudoleskea* (Bull. Torr. Bot. Club, XXVII), Dr. Best has substituted the name *P. rigescens* (Wils.) Lindb. for *P. stenophylla* Ren. & Card. It is impossible for us to admit any well grounded reason for this change; for, if Dr. Best saw, as he affirms, a specimen of *Leskea rigescens* Wils. identical with *P. stenophylla* Ren. & Card., on the other hand, we possess one which certainly belongs to *P. radicosa* (Drummond, Musci Americani, no. 225). Moreover, Dr. Best himself acknowledges that both species were mixed up under this number of Drummond's exsiccata and under the name *Hypnum congestum* Hook. & Wils. Now, as Wilson never described his *Leskea rigescens*, it is impossible to know to which of the two species he wished to give this name, and that must, therefore, be definitely abandoned. One of the two species should be called *P. radicosa* (Mitt.) Best, the other should preserve the name *P. stenophylla* Ren. & Card.

Thuidium abietinum Br. eur., fasc. 49–51, p. 9, pl. 5.

From Port Clarence (Trelease, 2034, 2036).

Claopodium bolanderi Best, in Bull. Torr. Bot. Club, XXIV, p. 431.

From Bailey Harbor (U. S. S. *Albatross* Exped. in 1893); Kodiak (J. M. Macoun).

Kindberg mentions *C. crispifolium* and *C. laxifolium* as coming from Alaska. His specimens of *crispifolium* that we have seen belong to *C. bolanderi*. We have not seen any of the second one. Otherwise, it has been established that *Leskea laxifolia* Hook. is none other than *Brachythecium reflexum* Br. eur.

Family HYPNACEÆ.

Camptothecium nitens Sch. Syn., ed. 1, p. 530.

From Point Gustavus (Coville and Kearney, without number).

C. lutescens Br. eur. has also been reported from Alaska.

BRACHYTHECIUM BERINGIANUM sp. nov.

(Pl. XXII, fig. 3^{a-e}.)

Dense cespitosum, habitu formis minoribus *B. albicantis* simile. Caulis erectus, 3–4 centim. altus, ramosissimus, ramis erectis, interdum fastigiatis, julaceis, acutis. Folia conferta, imbricata, caulina 1.5 millim. longa, 0.8 lata, ovato-lanceolata, basi paululum decurrentia, sat abrupte et breviuscule acuminata, concava, plicata, marginibus integris planis vel parce reflexis, ramea minora et angustiora, longius acuminata, costa tenui, basi 30–35 μ crassa, vix ad medium producta, sæpe furcata et interdum brevissima, cellulis alaribus numerosis, quadratis, in 5–6

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seriebus secundum margines superne productis, cæteris linearibus, 40–45 μ longis, 6–7 latis, parietibus incrassatis. Cætera ignota.

From St. Paul Island (Trelease, 1861, 2087); Agattu Island (U. S. S. *Albatross* Exped., 40).

Distinct from *B. acuminatum* Ren. & Card. by its habit, its more abruptly acuminate leaves, etc. It more closely resembles *B. albicans* Br. eur., from which it differs by its shorter and more abruptly acuminate leaves, its quadrate more numerous alar cells, its more chlorophyllose areolation, and by its narrower, short and often bifurcate costa.

Brachythecium albicans Br. eur., fasc. 52–54, p. 19, pl. 19.

From Yakutat Bay (Trelease, 2342); Muir Glacier (Trelease, 1909); Wrangell (Canby, 468, 472); Sturgeon River Bay, Kodiak (Trelease, 1930); St. Paul Island (Trelease, 1863); Agattu Island (U. S. S. *Albatross* Exped., 16 in part). Several forms.

Brachythecium salebrosum Br. eur., fasc. 52–54, p. 16, pl. 15, 16.

From Cape Fox (Trelease, 1762 in part, 1963); Skagway (Canby, 481 in part, forma *angustifolia*); Yukon River (W. H. Dall, in 1867); Sitka (Trelease, 2002); Agattu Island (U. S. S. *Albatross* Exped., 16 in part).

Brachythecium novæ-angliæ Jaeg. & Sauerb. Adumbr., II, p. 394.

From Kodiak (Trelease, 2057); St. Paul Island (Trelease, 2091). New to Alaska.

On these specimens nearly all the leaves are smooth on the back; however we have found a few branches with papillose leaves, which, added to the other characters, leaves no doubt as to their determination. Moreover, even on the specimens from New England, the leaves are sometimes quite smooth. This character is therefore variable, which prevents us from admitting the genus *Bryhnia*.

Mr. A. J. Grout has recently ascertained that *Hypnum chloropterum* C. Müll. & Kindb., from Canada, and *H. scabridum* Lindb., from Norway, should be reunited to *B. novæ-angliæ* (cf. Bull. Torr. Club, XXV, pp. 229–231). The distribution of this species, as it is now known, includes southern Norway, eastern Canada, Newfoundland, Miquelon Island, the Eastern States as far south as Maryland and as far west as Wisconsin, Alaska, the Bering Sea Islands and Japan.

Brachythecium rivulare Br. eur., fasc. 52–54, p. 13, pl. 12.

From Juneau (Trelease, 1796); Disenchantment Bay (Trelease, 1829); Orca (Trelease, 1840).

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Number 1829 resembles *B. latifolium* (Lindb.) Philib. by its widely decurrent leaves; but the latter is a more slender plant, with a thinner costa and leaves hardly or not at all plicate.

Brachythecium reflexum pacificum Ren. & Card. in Bot. Centralbl. 1890, No. 51.

(Pl. XXIII, fig. 4[a–c].)

Eurhynchium pacificum KINDB. Eur. and N. Amer. br., p. 101.

From Juneau (Trelease, 2173); Wrangell (Trelease, 1937); Cape Fox (Trelease, 1760*a*); Yakutat Bay (Trelease, 1746, 1758, 1826, 2339); Disenchantment Bay (Trelease, 2512; Brewer and Coe, 634); Muir Glacier (Trelease, 1753, 1754, 1755, 2469). New to Alaska.

This variety, which seems to occur along the Pacific Coast from Oregon to Alaska, differs from the type by its stouter aspect, its stem-leaves larger, less triangular, rather ovate-lanceolate, not so abruptly acuminate, and revolute on the borders in the lower part, by its costa thinner and generally vanishing at the base of the acumen, and by its leaf-areolation composed of cells of the same width (about 9 μ) but at least twice longer (80–90 μ, instead of 30–35); those in the angles longer too, rectangular, seldom quadrate. These characters seem to be constant, and perhaps Mr. Kindberg is right in considering this moss as a species distinct from *B. reflexum*.

Brachythecium asperrimum Kindb. in Mac. Cat. Can. pl., VI, Musci, p. 200.

From Cape Fox (Trelease, 2382). New to Alaska.

Brachythecium lamprochryseum giganteum Grout in Mem. Torr. Bot. Club, VI, p. 181.

From Atka Island (U. S. S. *Albatross* Exped., 44).

Brachythecium plumosum Br. eur., fasc. 52–54, p. 4, pl. 3.

From Kodiak (Trelease, 2194). New to Alaska.

Kindberg has mentioned *B. turgidum* Hartm. as Alaskan. Four species of the genus *Scleropodium*, viz: *S. illecebrum* Br. eur., *S. cespitosum* Br. eur., *S. colpophyllum* (Sulliv.) Grout, and *S. krausei* (C. Müll) Ren. & Card., have also been recorded from Alaska. We have not seen the first three; the last is a *Hypnum* of the section *Hygrohypnum*.

Eurhynchium myosuroides Sch. Syn., ed. 1, p. 549.

From Yakutat Bay (Trelease, 1820); Hot Springs (Trelease, 2083 in part); Unalaska (U. S. S. *Albatross* Exped., 41).

Forms approaching var. *spiculiferum* Card., or doubtful between this and var. *substoloniferum* Card.

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Eurhynchium myosuroides spiculiferum Card. in Bull. de l'herb. Boissier, VII, p. 431.

From Prince of Wales Island (J. M. Macoun).

Eurhynchium myosuroides humile Grav. in Rev. bryol., 1883, p. 33.

From New Metlakatla (Trelease, 1751 in part). New to Alaska.

Eurhynchium strigosum fallax Ren. & Card. in Bot. Gaz., 1889, p. 98.

From Skagway (Canby, 477, 481 in part, 482 in part).

Eurhynchium stokesii Br. eur., fasc. 57–61, p. 10, pl. 8.

From Cape Fox (Trelease, 1762*a*). New to Alaska.

Eurhynchium oreganum Jaeg. & Sauerb. Adumbr., II, p. 427.

From Hot Springs (Trelease, 2020). New to Alaska.

Eurhynchium cirrosum Husn. Muscol. gall., p. 338.

From Muir Glacier (Trelease, 1912).

E. myosuroides var. *stoloniferum* Auct., *E. strigosum* Br. eur. *typicum*, *E. vaucheri* Br. eur. and *E. stokesii* subsp. *pseudo-speciosum* Kindb. have been recorded by Kindberg from Alaska and the islands of Bering Sea.

Rhynchostegium serrulatum Jaeg. & Sauerb., Adumbr., II, p. 436.

From Alaska, sine loco (A. Kellogg). New to Alaska.

The presence of this species in Alaska is rather surprising; however, it is impossible not to refer to it the specimen we have had before our eyes.

Mr. Kindberg has recorded from Kodiak a *Raphidostegium subdemissum* Kindb. that we have not seen.

Plagiothecium undulatum Br. eur., fasc. 48, p. 17, pl. 13.

From Alaska, sine loco (W. H. Evans in 1897); Port Etches (J. M. Macoun); Point Gustavus (Coville and Kearney, 790); Orca (Trelease, 1739 in part, 1740; Setchell, 1214); Sitka (Trelease, 1736, 2497; Setchell, 1256; J. M. Macoun; W. G. Wright, 1609); Hot Springs (Trelease, 1735); Douglas Island (Trelease, 1737, 1743 in part).

PLAGIOTHECIUM FALLAX sp. nov.

(Pl. XXII, fig. 4[a–c].)

Dioicum, robustum, lutescenti-viride, nitidum. Caulis prostratus vel decumbens, 5–8 centim. longus, flexuosus, parce ramosus, apice attenuato sæpius radiculosus. Folia laxe complanato-disticha, siccitate subundulato-crispatula, 2.5 millim. longa, 1–1.3 lata, e basi haud decurrente oblongo-lanceolata, asymmetrica, late breviterque acuminata, longitudinaliter plicatula, marginibus planis integris, costa

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gemella, inæquali, crure longiore ad ⅓ vel ½ producta, cellulis basilaribus paucis, quadratis vel breviter rectangulis, cæteris linearibus 125–225 μ longis, 9–14 latis. Cætera ignota.

From Douglas Island (Trelease, 1743 in part).

Resembling in habit the species of the *denticulatum* group, but very distinct by its leaves being not decurrent.

Plagiothecium denticulatum Br. eur., fasc. 48, p. 12, pl. 8.

From Cape Fox (Trelease, 2376); Orca (Trelease, 1739 in part, 1741, 1942); Yakutat Bay (Trelease, 2330); Sitka (Trelease, 1431, 2356, 2357, 2496); Douglas Island (Trelease, 2406).

Plagiothecium denticulatum undulatum Ruthe in litt. 1873. Geheeb in Rev. bryol., 1877, p. 42, fide Limpricht.

P. ruthei LIMPR. Laubm., II, p. 271.

From Yakutat Bay (Trelease, 2327). New to Alaska.

Plagiothecium denticulatum recurvum Warnst. Moosfl. d. Prov. Brandenb., p. 73, fide Limpricht.

P. curvifolium SCHLIEPH. mss. Limpr. Laubm., II, p. 269,

From Douglas Island (Trelease, 1738). New to Alaska.

Plagiothecium denticulatum donii Lindb. in Not. Sällsk. fauna et fl. fenn., 1867.

From New Metlakatla (Trelease, 1751 in part). New to Alaska.

Plagiothecium sylvaticum Br. eur., fasc. 48, p. 14, pl. 11.

From Juneau (Brewer and Coe, 691*b*); Kodiak (Trelease, 2192) New to Alaska.

Plagiothecium roeseanum Br. eur., fasc. 48, p. 15, pl. 10.

From Kodiak (Trelease, 1844, 2191). New to Alaska.

Plagiothecium muehlenbeckii Br. eur., fasc. 48, p. 11, pl. 6.

From Orca (Trelease, 2251); Kodiak (Trelease, 2207); Hot Springs (Trelease, 2349). New to Alaska.

Plagiothecium elegans Sulliv. Moss. of U. S., p. 80.

From Farragut Bay (Coville and Kearney, 469); Hot Springs (Trelease, 1742, 1757); Douglas Island (Trelease, 2391). New to Alaska.

P. pulchellum Br. eur. has been recorded from the islands of Bering Sea by Mr. Kindberg.

Amblystegium serpens Br. eur., fasc. 55–56, p. 9, pl. 3.

From Cape Fox (Trelease, 1760, 1761, 1762, 2375); St. Paul Island (Trelease, 2089 in part). New to Alaska.

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AMBLYSTEGIUM SERPENS BERINGIANUM var. nov.

A forma typica differt foliis ovato-lanceolatis latioribus brevius acuminatis, costa validiore ad basin acuminis producta, cellulis basilaribus rectangulis, parietibus incrassatis.

From St. Paul Island (Trelease, 2089 in part).

Under number 1760 we found some stems of a stouter species, much resembling *A. radicale* (Pal. Beauv.) Mitt.

AMBLYSTEGIUM VARIUM ALASKANUM var. nov.

Robustius, dense ramosum, late depresso-cespitosum, folia breviora, late ovata, subito constricta, breviter et anguste acuminata, cellulis alaribus inflatis, multo majoribus.

From Muir Glacier (Trelease, 1752).

Genus **Hypnum** Dill.

Section CHRYSOHYPNUM Hpe.

HYPNUM TRELEASEI Ren. sp. nov.

(Pl. XXII, fig. 5^{a-e}.)

Dense cespitosum, fragile, lutescenti-viride. Caulis brevis, 2–3 centim. altus, erectus, inferne radiculosus, ramis erectis fastigiatis. Folia conferta, parva, subimbricata, interdum subhomomalla, 1.2 millim. longa, 0.6 lata, ovato-lanceolata, breviuscule acuminata, vix plicatula, plerumque magno augmento, præcipue basin versus, minute denticulata, costa gemella brevi, cellulis basilaribus quadratis vel breviter rectangulis, chlorophyllosis, externis elongatis decurrentibus, cæteris linearibus, 30–40 μ longis, 6–7 latis. Cætera ignota.

From Virgin Bay (Trelease, 2305); St. Matthew Island (Trelease, 2158, 2165).

The description here given, as also the drawing, is based on the St. Matthew Island specimens. The Virgin Bay specimen has the leaves longer, with a more elongated and narrower acumen, and a closer areolation, formed of longer and narrower cells. There is, however, no doubt of the specific identity of the two specimens. This species should be placed near *H. stellatum* Schreb., from which it is distinguished by its much smaller dimensions, its short and fastigiate stems, its leaves which are small, imbricate, shortly acuminate and for the most part finely denticulate, and, finally, by its small, quadrate alar-cells, the median ones shorter.

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Hypnum stellatum Schreb. Spic. fl. lips., p. 92.
From Port Wells (Trelease, 1836); Kodiak (Trelease, 1923).

Hypnum polygamum minus Sch. Syn., ed. 1, p. 604.
From Yakutat Bay (Trelease, 2341). New to Alaska.

Section DREPANOCLADUS C. Müll.[1]

Hypnum aduncum kneiffii Sch. Syn., ed. 2, p. 727.
From St. Paul Island (J. M. Macoun). New to Alaska.
This specimen was attributed by Mr. Kindberg to *H. conflatum* C. Müll. & Kindb. But, according to Renauld, it is impossible to separate it from *H. aduncum kneiffii*.

Hypnum fluitans Linn. Flor. suec., ed. 2, p. 899 in part.
From Yakutat Bay (Brewer and Coe, 690).
A form near var. *jeanbernati* Ren.

Hypnum fluitans alpinum Sch. Syn., ed. 1, p. 611.
From St. Lawrence Island (Trelease, 1981; Coville and Kearney, 1984; L. J. Cole). New to Alaska.

Hypnum fluitans exannulatum Ren. Rev. harpid., 1879.
From Yakutat Bay (Trelease, 1745). New to Alaska.

Hypnum revolvens Sw. Disp. musc. frond. suec., p. 101, pl. 7, f. 14.
From Kodiak (Trelease, 2030, 2031); St. Matthew Island (Trelease, 1890, 2163*a*); Hall Island (Trelease, 1663 in part, 2130 in part).

Hypnum uncinatum Hedw. Descr., IV, p. 65, pl. 25.
From Alaska, sine loco (F. Funston, 144); Juneau (Setchell, 1234; Canby, 486, 496; Coville and Kearney, 575); Skagway (Canby, 481 in part); Wrangell (Trelease, 2017); Head of Russell Fiord (Coville and Kearney, 950); Disenchantment Bay (Trelease, 1958, 2023, 2024); Orca (Trelease, 1961); Port Wells (Trelease, 1962, 2028); Muir Glacier (Trelease, 1951); Point Gustavus (Coville and Kearney, 753); Sitka (Trelease, 2005); Sturgeon River Bay, Kodiak (Trelease, 2225); Port Clarence (Trelease, 1971, 1973); St. Matthew Island (Coville and Kearney, 2129); St. Paul Island (Trelease, 1864).
With forms passing to varieties *plumulosum*, *subjulaceum* and *orthothecioides*.

[1] We are indebted to Mons. F. Renauld for the determinations of the species of this group.

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Hypnum uncinatum forma **breviseta** Ren. in litt.

From Skagway (Canby, 842 in part); Sitka (Trelease, 1938; Coville and Kearney, 898); Kodiak (Trelease, 2058).

Hypnum uncinatum forma **plumosa** Ren. in Husn., Muscol. gall., p. 378.

Hypnum uncinatum plumosum SCH. Syn., ed. 1. p. 612.

From Indian Camp, Yakutat Bay (Brewer and Coe, 642); Disenchantment Bay (Trelease, 1957); Point Gustavus (Coville and Kearney, 753 in part); Yukon River (W. H. Dall, in 1867); Port Clarence (Brewer and Coe, 672; Trelease, 2014); St. Matthew Island (Trelease, 1887 in part, 1888 in part); Hall Island (Trelease, 2133).

Hypnum uncinatum plumulosum Br. eur., fasc. 57–61, p. 31, pl. 20, fig. γ, 1, 2.

From Orca (Trelease, 1943); Indian Camp, Yukutat Bay (Brewer and Coe, 643; forma *crassa* ad var. *polare* accedens); Port Clarence (Trelease, 1969, 1970, 1972); St. Lawrence Island (Trelease, 1982); St. Matthew Island (Trelease, 2163); Hall Island (Trelease, 1967); Plover Bay, Siberia (Trelease, 1977).

HYPNUM UNCINATUM POLARE Ren. var. nov.

Habitu varietati *plumulosum* simile, sed rete basilari laxiore parenchymatoso, cellulis mediis brevioribus, magis chlorophyllosis.

From St. Matthew Island (Trelease, 2159), Plover Bay, Siberia (Trelease, 1978).

Hypnum uncinatum subjulaceum Br. eur., loc. cit., fig. ε, 1, 2, forma **orthothecioides** Ren. in Husn. Muscol. gall., p. 378.

From Bailey Harbor (U. S. S. *Albatross* Exped.); Mist Harbor, Nagai Island (U. S. S. *Albatross* Exped.); Yakutat Bay (Trelease, 2026); Kodiak (Trelease, 1926, 1927); St. Paul Island (Trelease, 1975, 1985; J. M. Macoun); Hall Island (Trelease, 1966); Plover Bay, Siberia (Trelease, 1976; Coville and Kearney, 1851).

Section CRATONEURON Sulliv.

Hypnum filicinum Linn. Spec. pl., p. 1125.

From Yakutat Bay (Trelease, 1818); Hidden Glacier Inlet (Trelease, 1814); Disenchantment Bay (Trelease, 1825, 1955, 2511); Head of Russell Fiord; (Coville and Kearney, 956); Muir Glacier (Trelease, 1756, 1792, 1807). Several forms.

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HYPNUM SULCATUM STENODICTYON Ren. var. nov.

Hypnum sulcatum SCH. Syn. ed., 1, p. 699.

A forma typica rete densiore cellulis angustioribus distincta.

From Muir Glacier (Trelease, 2019).

Section PTILIUM Sulliv.

Hypnum crista-castrensis Linn. Sp. pl., p. 1125.

From Virgin Bay (Trelease, 2027); Sitka (Trelease, 2022); Kodiak (Trelease, 2054; Coville and Kearney, 2339, 2261*a*); Mist Harbor, Nagai Island (U. S. S. *Albatross* Exped.).

Section STEREODON Brid.

Hypnum circinale Hook. Musci exot., pl. 107.

From Juneau (Brewer and Coe, 698); Yakutat Bay (Trelease, 2329); Farragut Bay (Trelease, 1935, 1936; Brewer and Coe, 618, 623); Orca (Trelease, 1748, 1941, 1943 in part, 1944, 2250, 2500; Setchell, 1210); Virgin Bay (Trelease, 2304); Sitka (Trelease, 1939, 1940; Coville and Kearney, 825; Setchell, 1257, 1267; Canby, 462; J. M. Macoun); Hot Springs (Trelease, 2345); Kodiak (Trelease, 1945, 2211; L. J. Cole); Wood Island (Brewer and Coe, 659, 660, 662); Prince of Wales Island (J. M. Macoun).

We do not distinguish from *H. circinale*, *H. sequoieti* C. Müll. in Flora, 1875, p. 91, the characters mentioned for the latter being inconstant and of little importance. We must equally refer to *H. circinale* the *Raphidostegium pseudorecurvans* Kindb. Not. on Canad. bryol., 1893, according to the specimens of the latter which were communicated to us by Mr. J. M. Macoun.

As we have said elsewhere (Revue bryologique, 1890, p. 18, and Hedwigia, 1893, p. 275) it was a mistake to describe *H. circinale* as being monœcious; it is certainly diœcious, for on a hundred specimens that we have had the opportunity of examining, we have never found flowers of both sexes on the same stem.

Hypnum callichroum Br. eur., fasc. 57–61, p. 27, pl. 16.

From Port Wells (Trelease, 1747); Orca (Trelease, 1749, 2261); Yakutat Bay (Trelease, 1746); Head of Russell Fiord (Coville and Kearney, 948 in part); Wrangell (Trelease, 2018); Port Etches (J. M. Macoun); Sitka (Trelease, 2021). New to Alaska.

Hypnum alaskæ Kindb. Not. on Canad. bryol., 1893.

From Port Etches (J. M. Macoun).

This species appears to be very close to the preceding, judging from the small specimen we received; however, it differs from it by its

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smaller dimensions, its creeping and radiculose stems and its much narrower leaves.

Hypnum dieckii Ren. & Card. in Bot. Centralbl., 1890, no. 51. Hedwigia, 1893, p. 278.

From Orca (Trelease, 1960); Sitka (Trelease, 1744). New to Alaska.

Hypnum hamulosum Br. eur., fasc. 57–61, p. 20, pl. 10.

From Yakutat Bay (Trelease, 2025); Port Clarence (Trelease, 1968); Hall Island (Trelease, 2032).

The alar cells are here a little more numerous than on the European type; but we have specimens from the Pyrenees that are identical in this respect with those from Alaska.

Hypnum canadense Kindb. in Bull. Torr. Bot. Club, XVII, p. 280. Mac. Cat. Can. pl., VI, Musci, p. 236.

From Orca (Setchell, 1201); Prince of Wales Island (J. M. Macoun).

This species differs from *H. imponens* Hedw. by the auricles of the leaves being formed of one or two large outer hyaline cells, the inner cells being brown or yellowish.

Hypnum vaucheri Lesq. Cat. mouss. suisses, p. 48. Sch. Syn., ed. 1, p. 697.

From Bailey Harbor (U. S. S. *Albatross* Exped.).

Although the areolation is a little closer than usual, the alar cells, much more numerous than in *H. cupressiforme*, do not seem to leave any doubt on the determination of this moss.

Section HYGROHYPNUM Lindb.

Hypnum ochraceum Turn. in Wils. Bryol. brit., p. 400.

From Disenchantment Bay (Trelease, 1820); Kodiak (Trelease, 2195).

Hypnum ochraceum flaccidum Milde, Bryol. sil., p. 376.

From Disenchantment Bay (Trelease, 1828); Sitka (Trelease, 2366).

HYPNUM SUBEUGYRIUM OCCIDENTALE var. nov.

Hypnum subeugyrium REN. & CARD. in Bot. Gaz., XXII, p. 52.

A forma typica Terræ Novæ differt foliis pro more latioribus, mollioribus, magis concavis, apice integris, cellulisque alaribus paulo majoribus, auriculas interdum subinflatas sed semper multo minus distinctas quam in *H. eugyrio* efformantibus. Costa interdum subsimplex.

From Hidden Glacier Inlet, Yakutat Bay (Trelease, 1784); Muir Glacier (Trelease, 1805).

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Hypnum krausei C. Müll. in Flora, 1887, p. 224.

From Takhin valley (Dr. Krause).

This moss, that C. Müller placed in his section *Illecebrina*, which corresponds to the genus *Scleropodium* Br. eur., is certainly a *Hygrohypnum* (*Limnobium* Sch.), as appears from an examination of the original specimen, which was communicated to us by the Royal Botanical Museum in Berlin. It comes near *H. subeugyrium occidentale* Card. & Thér., but differs from it by its longer leaves, its almost scarious and much less chlorophyllose areolation, and its thinner costa.

Section CALLIERGON Sulliv.

Hypnum cordifolium Hedw. Descr., IV, p. 97, pl. 37.

From Yakutat Bay (Trelease, 1795); Kodiak (Trelease, 1842 in part); Sitka (Trelease, 2369).

Hypnum schreberi Willd. Prodr. fl. berol., no. 955.

From White Pass, 3,000 ft. (Trelease, 1950); Orca (Setchell, 1208); Sitka (Trelease, 2007); Port Clarence (Trelease, 1869, 2013, 2035); St. Matthew Island (Coville and Kearney, 2110); Hall Island (Trelease, 2033).

Hypnum sarmentosum Wahlenb. Fl. lapp., p. 380.

From Port Wells (Coville and Kearney, 1293 in part).

HYPNUM SARMENTOSUM BERINGIANUM var. nov.

Hypnum sarmentosum WAHLENB. Fl. lapp., p. 380.

A forma typica differt caulibus gracilioribus, laxius foliosis, costa latiore et præsertim cellulis alaribus multo minoribus, pro more quadratis, vix dilatatis.

From St. Matthew Island (Trelease, 1888 in part, 1889).

By the structure of the angles of the leaf, this moss comes near *H. brunneo-fuscum* C. Müll. from the Chukchi peninsula, but the latter has a different facies, a closer areolation and a much thinner costa.

Hypnum stramineum Dicks. Fasc. pl. crypt., II, p. 6, pl. 1, f. 9.

From Unalaska (U. S. S. *Albatross* Exped., 11); Port Clarence (Trelease, 1866, 1870).

Section CALLIERGIDIUM Ren. in litt.

Pseudocalliergon REN. in Bryologist, IV, p. 63, non Limpr.

HYPNUM PLESIOSTRAMINEUM Ren. sp. nov.[1]

(Pl. XXIII, fig. 2^{a-h}.)

Cespites laxi, molles. Caulis gracilis, erectus, 4–6 centim. altus, simplex vel parce ramosus, ramis gracilibus. Folia sat conferta,

[1] See note 3, p. 347.

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erecta, apice tantum paululum patentia, circa 1.4 millim. longa, 0.6 lata, diversiformia, inferiora ovato-oblonga vel subdeltoidea, acuminata, subobtusa, superiora elliptica, acumine latiore et obtusiore, ramea ovata, rotundato-obtusa, omnia plicatula, marginibus planis sinuolatis, costa tenui, ad ¾ vel ultra producta, basi 40–50 μ crassa, cellulis alaribus magnis, laxis, hyalinis, auriculas inflatas pulchre distinctas efformantibus, mediis anguste linearibus, flexuosis, extremitatibus obtusis, 40–60 μ longis, 5–6 latis, apicalibus brevibus, ovatis vel subhexagonis. Cætera ignota.

From Yukon River (W. H. Dall, in 1867).

This species resembles both *H. stramineum* Dicks. and *H. pseudo-stramineum* C. Müll.; but it is with the latter that it has the closest affinity. It differs from it by its leaves being shorter, subdeltoid, with a costa thicker (40–50 μ instead of 30–40), longer, usually exceeding the ¾, and finally by the firm areolation, formed of flexuous cells, rather obtuse (not truncate) at the ends, with thick walls, and resembling those of *Hygrohypnum*.

The comparative figures of *H. pseudo-stramineum* given on Plate XXIII, were supplied to us by Mons. Renauld, who drew them from an original collected by C. Müller at Halle-am-Saale.

Mr. Kindberg has described a *H. pseudo-complexum* Kindb. from Alaska, of which we have not seen any specimen. *H. alaskanum* Lesq. & Jam. is also unknown to us.

Hylocomium splendens Br. eur. fasc., 49–52, p. 5, pl. 1.

From Alaska, sine loco (W. H. Evans, in 1897); Orca (Setchell, 1212; Trelease, 2050); Muir Glacier (Coville and Kearney, 673); Yakutat Bay (Trelease, 2049); Disenchantment Bay (Trelease, 2047); Head of Russell Fiord (Coville and Kearney, 957); New Metlakatla (Trelease, 2041); Farragut Bay (Trelease, 2042); Wrangell (Canby, 450); Karluk (Brewer and Coe, 686); Koyukuk River (F. C. Schrader, in 1899); Sitka (Setchell, 1260; Trelease, 2045, 2046; W. G. Wright, 1605); Kodiak (L. J. Cole; Trelease, 2029, 2052, 2053); Wood Island (Brewer and Coe, 663).

Hylocomium splendens gracilius Boul. Musc. de la France, p. 10.

H. alaskanum KINDB. in Mac. Cat. Can. pl., VI, Musci, p. 248.

From Muir Glacier (Trelease, 2043, 2044); Kodiak (Trelease, 2051); Unalaska (J. M. Macoun); Popof Island (Saunders, 2038); Hall Island (Trelease, 1989 in part, 2055, 2056).

This variety is *Hylocomium alaskanum* of Kindberg, but we much doubt whether it is the true *Hypnum alaskanum* of Lesquereux

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and James (Proced. Amer. Acad., XIV, p. 139, and Manual, p. 405). These authors compare their plant to *Hypnum Schreberi*, to which this var. *gracilius* bears no resemblance, and attribute to it obtuse leaves, whereas they are apiculate on the moss of which we are speaking. Besides, it would be very surprising if such experienced bryologists as Lesquereux and James had not noticed the evident relations which would have existed between their species and *Hylocomium splendens*, if the identification proposed by Mr. Kindberg was exact. Until the contrary is proved, we think that *H. alaskanum* Lesq. & Jam. is a different species, much more resembling *H. schreberi* than *Hylocomium splendens*.

Hylocomium umbratum Br. eur., fasc. 49–52, p. 6, pl. 2.

From Yakutat Bay (Trelease, 1965 in part); Disenchantment Bay (Trelease, 2048). New to Alaska.

Hylocomium squarrosum Br. eur., fasc. 49–52, p. 9, pl. 6.

Yakutat Bay (Trelease, 1821 in part, 1959, 2328); Point Gustavus (Saunders, 2000); Cape Fox (Trelease, 1965); Sturgeon River Bay, Kodiak (Trelease, 1932); Unalaska (U. S. S. *Albatross* Exped., 19); St. Paul Island (Trelease, 1862, 1974); Hall Island (Trelease, 1883).

Numbers 1959, 1965 and 2000 are forms coming more or less near *H. calvescens* (Wils.) Jaeg., but on the plant from Finland the acumen is broader and shorter, which constitutes the chief character of this form, which, otherwise, it is impossible for us to specifically separate from *H. squarrosum*.

Hylocomium loreum Br. eur., fasc. 49–52, p. 7, pl. 4.

From Alaska, sine loco (W. H. Evans, in 1897); Yakutat Bay (Brewer and Coe, 648*a*; Trelease, 1956, 2009); Disenchantment Bay (Trelease, 1954, 2008); Muir Glacier (Coville and Kearney, 674); Point Gustavus (Coville and Kearney, 783); Orca (Setchell, 1202; Trelease, 2011); Farragut Bay (Trelease, 1994); New Metlakatla (Trelease, 1993); Head of Russell Fiord (Coville and Kearney, 947, 957*a*); Sitka (Setchell, 1261; Trelease, 2001, 2006; W. G. Wright, 1606; J. M. Macoun); Hot Springs (Trelease, 2004); Kodiak (L. J. Cole); Wood Island (Brewer and Coe, 661).

Hylocomium triquetrum Br. eur., fasc. 49–52, p. 8, pl. 5.

From Skagway (Canby, 425); Disenchantment Bay (Trelease, 1915); Farragut Bay (Coville and Kearney, 467); Point Gustavus (Coville and Kearney, 789); Tongas Village (Brewer and Coe, 703); Kodiak (Trelease, 1920 in part, 1921, 1933); Sitka (Trelease, 1913;

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Canby, 427, 448); Hall Island (Trelease, 1989); St. Paul Island (U. S. S. *Albatross* Exped.).

HYLOCOMIUM TRIQUETRUM BERINGIANUM var. nov.

Colore lutescente foliisque erecto-imbricatis, subhomomallis, minus papillosis distinctum.

From Hall Island (Trelease, 1989 in part; Coville and Kearney, 2059).

Hylocomium rugosum De Not. Epil., 99.

From Skagway (Canby, 483 in part).

POSTSCRIPT.

NOTE 1.—Since the completion of this paper for the press, in March, 1901, a very important catalogue of the bryophytes of the Yukon, comprising 24 hepatics, 7 sphagna, and 222 mosses, has been published by Mr. R. S. Williams, in the *Bulletin of the New York Botanical Garden*. Mr. Willlams's list includes a large number of mosses that are here indicated as new to Alaska. The following species, however, to the number of fifty, are not found in Mr. Williams's list:

Rhabdoweisia fugax,
Aongstroemia longipes,
Dicranella grevilleana,
Dicranum anderssonii,
Hypnum callichroum,
H. dieckii,
H. subeugyrium,
D. starkei,
D. albicans,
D. groenlandicum,
D. neglectum,
D. howellii,
Dicranodontium longirostre,
D. aristatum,
Ditrichum homallum,
Barbula aciphylla,
Grimmia maritima,
G. elatior forma?,
Amphoridium mougeotii,
Orthotrichum arcticum,
Tayloria tenuis,
Splachnum luteum,
Philonotis macounii,
P. capillaris,
Meesea tschuctschica,
Webera annotina,
Bryum bimum,
B. pallens,
Mnium insigne,
M. nudum,
Aulacomnium androgynum,
Oligotrichum integrifolium,
Fontinalis patula,
Pterygophyllum lucens?,
Orthothecium intricatum,
Pseudoleskea atrovirens,
P. stenophylla,
Brachythecium novæ-angliæ,
B. asperrimum,
B. plumosum,
Eurhynchium stokesii,
E. oreganum,
Rhynchostegium serrulatum,
Plagiothecium sylvaticum,
P. roeseanum,
P. muehlenbeckii,
P. elegans,
Amblystegium serpens,
A. varium,
Hylocomium umbratum.

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Of the species and varieties here described as new only one, *Hypnum plesiostramineum*, may possibly be identical with one of Mr. Williams's new species, *H. amblyphyllum*.

It should also be added that Mr. Williams's list contains 115 species not found in our list, so that at present the total number of mosses unquestionably shown to be Alaskan or of the Bering Sea islands is about 350.

NOTE 2 (p. 326).—In a recent paper in the Journal of Botany, vol. 39, pp. 339–341, Mr. E. S. Salmon points out that *Bartramiopsis lescurii* has the same leaf structure as *Lyellia crispa*, and he suggests placing it in this genus. But *Bartramiopsis* differs from *Lyellia* by its small, erect, symmetrical, not angular and macrostomate capsule, and it seems preferable to keep it as a distinct genus.

NOTE 3 (p. 343).—A preliminary diagnosis of this moss has been published by Mr. Renauld in Bryologist, IV, p. 65. It is perhaps the same species as *H. amblyphyllum* Williams, in Bull. N. Y. Bot. Garden, II, p. 139.

June, 1902.

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PLATE XIII.

NOTE.—Nachet's objectives 1, 3 and 5, oculars 1 and 2, with camera lucida. All drawings are reduced ¼ in photo-engraving. The magnification figures here printed are true for the drawings *as printed*.

FIGS. 1, *a–i*. *Cynodontium treleasei*.
1, *a*. Entire plant, natural size.
1, *b*. Leaf (× 34).
1, *c*. Apex of the leaf (× 135).
1, *d*. Perichætial leaf (× 34).
1, *e*. Capsule (× 13).
1, *f*. Lid (× 30).
1, *g*. Basal areolation of the leaf (× 135).
1, *h*. Marginal areolation in the middle (× 270).
1, *i*. Areolation in the upper part (× 270).
2, *a–b*. *Dichodontium pellucidum kodiakanum*.
2, *a*. Leaves (× 13).
2, *b*. Apex of the leaf (× 60).
3, *a–f*. *Dicranum subflagellare*.
3, *a*. Entire plant, natural size.
3, *b*. Leaf (× 26).
3, *c*. Apex of the same (× 135).
3, *d*. Basal areolation (× 135).
3, *e*. Areolation in the middle of a leaf (× 270).
3, *f*. Areolation in the upper part (× 270).
4, *a–e*. *Trichostomum cuspidatissimum*.
4, *a*. Entire plant, natural size.
4, *b*, *b*. Leaves (× 35).
4, *c*. Basal areolation (× 135).
4, *d*. Areolation in the middle of a leaf (× 135).
4, *e*. Areolation of the upper part (× 135).

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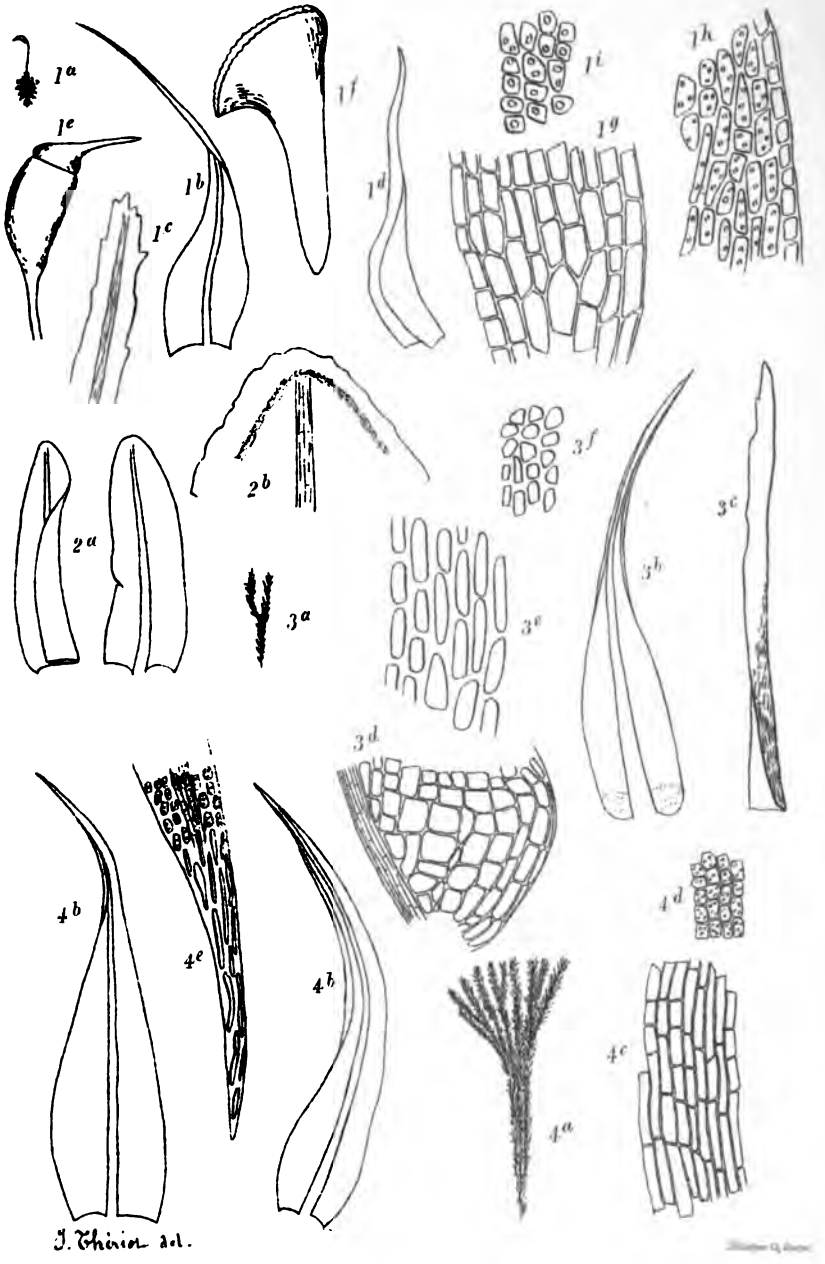

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PLATE XIV.

FIGS. 1, *a–e.* *Trichostomum sitkanum.*

1, *a.* Entire plant, natural size.

1, *b, b.* Leaves (× 13).

1, *c.* Basal areolation of a leaf (× 135).

1, *d.* Areolation in the middle (× 135).

1, *e.* Areolation in the upper part (× 135).

2, *a–i.* *Pottia heimii beringiana.*

2, *a.* Entire plant, natural size.

2, *b, b, b, b.* Leaves (× 13).

2, *c.* Transverse section of a leaf (× 60).

2, *d.* Part of the same (× 135).

2, *e.* Basal areolation of the leaf (× 135).

2, *f.* Areolation in the middle (× 135).

2, *g.* Areolation of the apex (× 135).

2, *h.* Capsule in moist state (× 13).

2, *i.* Capsule ripe, in dry state (× 13).

3, *a–i.* *Barbula brachypoda.*

3, *a.* Entire plant, natural size.

3, *b, b, b.* Lower leaves (× 13).

3, *c, c.* Upper leaves (× 13).

3, *d, d.* Perichætial leaves (× 13).

3, *e.* Basal areolation of the leaf (× 135).

3. *f.* Areolation in the middle (× 135).

3, *g.* Areolation of the upper part (× 135).

3, *h.* Capsule in moist state (× 13).

3, *i.* Portion of the annulus (× 60).

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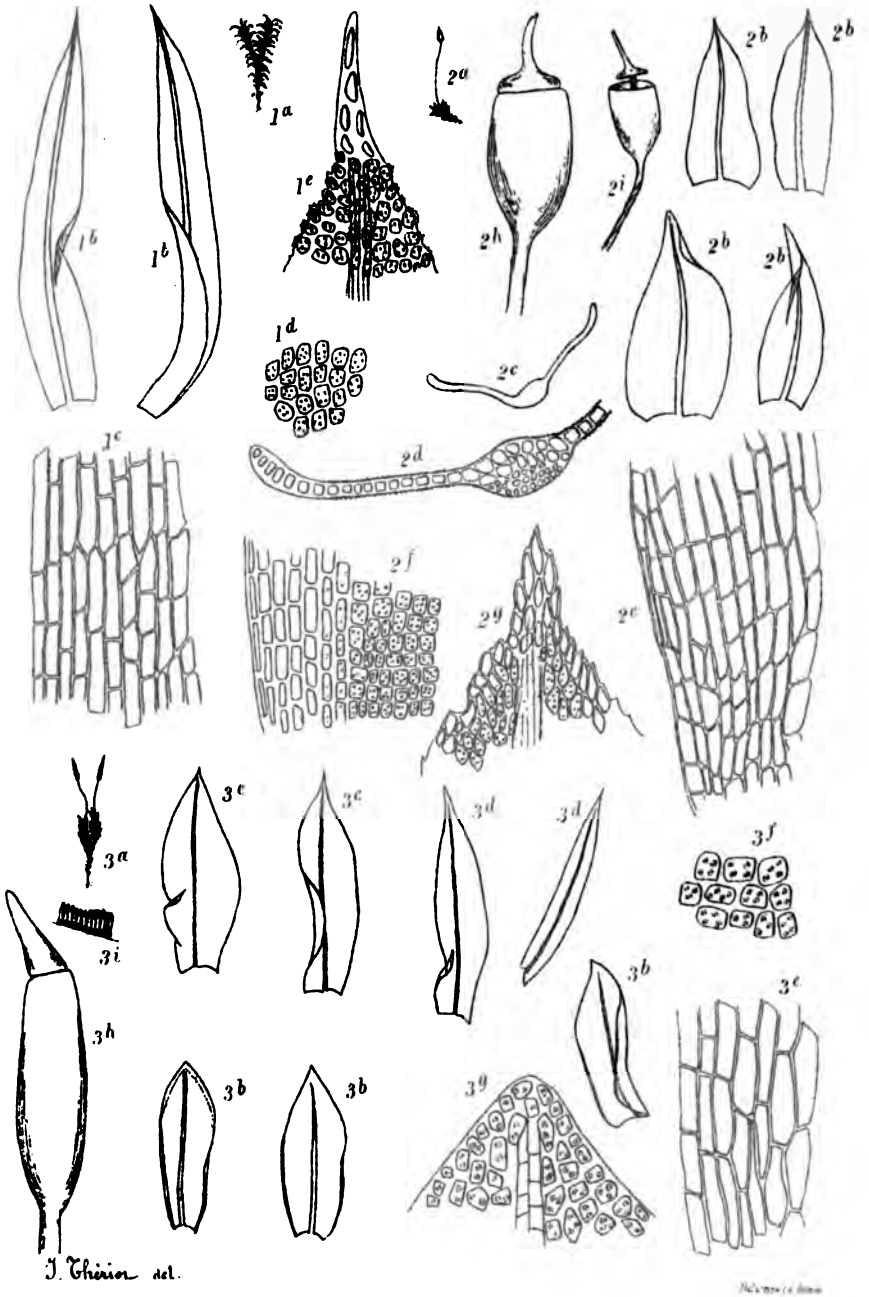

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PLATE XV.

FIGS. 1, *a–g*. ***Barbula rigens.***

1, *a*. Entire plant, natural size.

1, *b*, *b*. Leaves (× 26).

1, *c*. Apex of a leaf (× 135).

1, *d*. Basal areolation (× 135).

1, *e*. Cells in the middle of a leaf (× 135).

1, *f*. Transverse section of the leaf in the lower part (× 135).

1, *g*. Transverse section of the leaf in the upper part (× 180).

2, *a–g*. ***Barbula treleasei.***

2, *a*. Entire plant, natural size.

2, *b*. Leaf (× 26).

2, *c*. Perichætial leaf (× 26).

2, *d*. Apex of the stem leaf (× 60).

2, *e*. Basal areolation of same (× 135).

2, *f*. Cells in middle of same (× 135).

2, *g*. Old capsule in dry state (× 13).

3, *a–h*. ***Rhacomitrium cyclodictyon.***

3, *a*. Entire plant, natural size.

3, *b*, *b*. Leaves (× 26).

3, *c*. Perichætial leaf (× 26).

3, *d*. Transverse section of a stem leaf (× 100).

3, *e*. Basal areolation of same (× 270).

3, *f*. Areolation in the middle (× 270).

3, *g*. Areolation of the apex (× 135).

3, *h*. Old capsule in moist state (× 13).

4, *a–g*. ***Ulota alaskana.***

4, *a*. Entire plant, natural size.

4, *b*, *b*, *b*. Leaves (× 13).

4, *c*. Marginal areolation in the lower part (× 135).

4, *d*. Capsule and calyptra (× 13).

4, *e*. Capsule and lid (× 13).

4, *f*. Capsule ripe, in dry state (× 13).

4, *g*. Same, in moist state (× 13).

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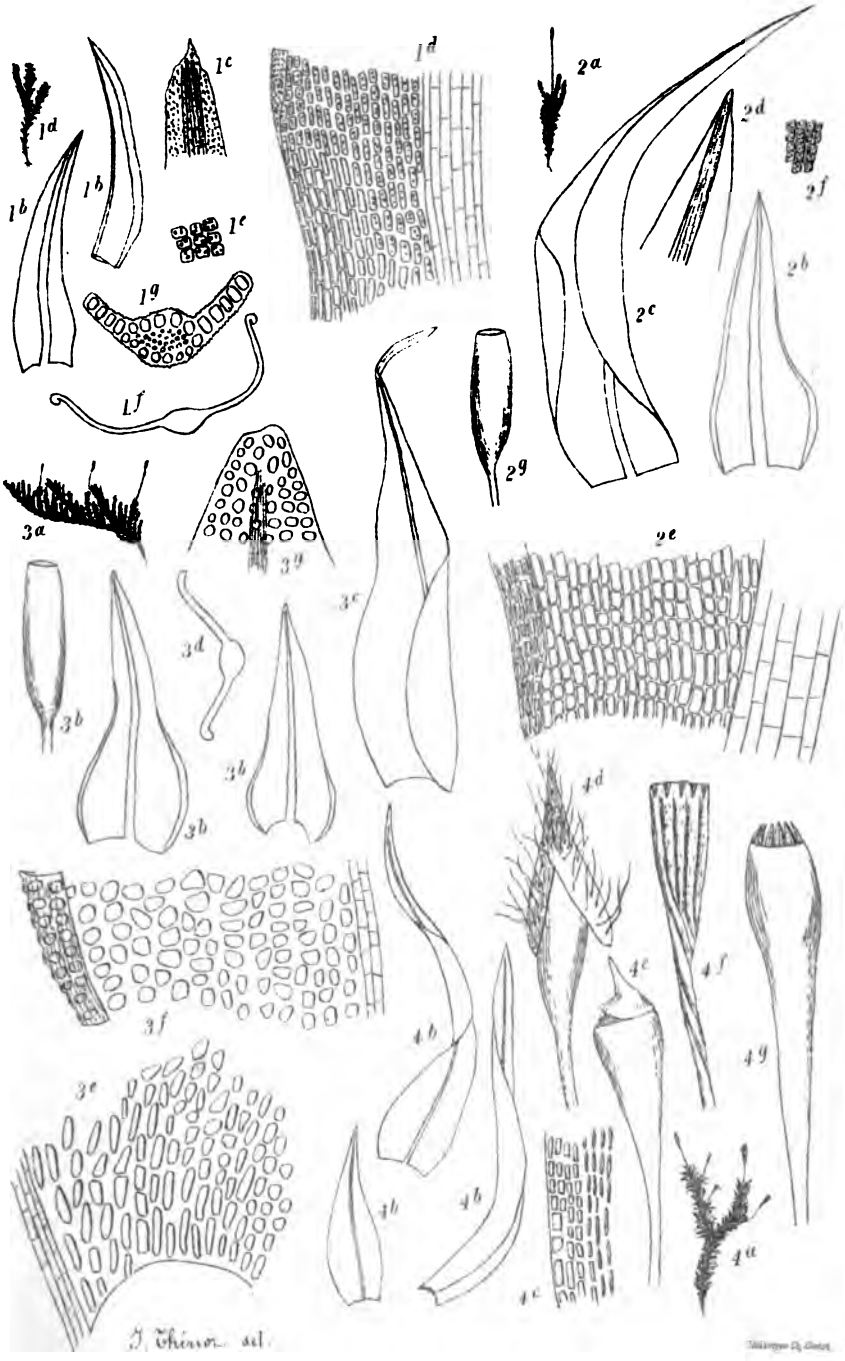

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PLATE XVI.

FIGS. 1, *a–i.* *Barbula saundersii.*

1, *a.* Entire plant, natural size.

1, *b.* Leaf (× 26).

1, *c.* Apex of the same (× 60).

1, *d.* Part of a transverse section of the same (× 100).

1, *e.* Perichætial leaf (× 26).

1, *f.* Basal areolation of a stem-leaf (× 135).

1, *g.* Cells in the middle of the same (× 270).

1, *h.* Capsule and lid (× 13).

1, *i.* Capsule and peristome (× 13).

2, *a–n.* *Orthotrichum fenestratum.*

2, *a.* Entire plant, natural size.

2. *b*, *b*, *b*. Leaves (× 13).

2, *c.* Transverse section of a leaf (× 60).

2, *d.* Transverse section of the costa (× 270).

2, *e.* Basal areolation of a leaf (× 135).

2, *f.* Areolation in the middle (× 135).

2, *g.* Areolation of the apex (× 135).

2, *h.* Capsule and lid (× 13).

2, *i.* Calyptra (× 13).

2, *j.* Capsule, deoperculate, in moist state (× 13).

2, *k.* The same split lengthwise (× 13).

2, *l.* A stomate (× 135).

2, *m.* A tooth of the peristome (× 135).

2, *n.* Upper part of the same (× 270).

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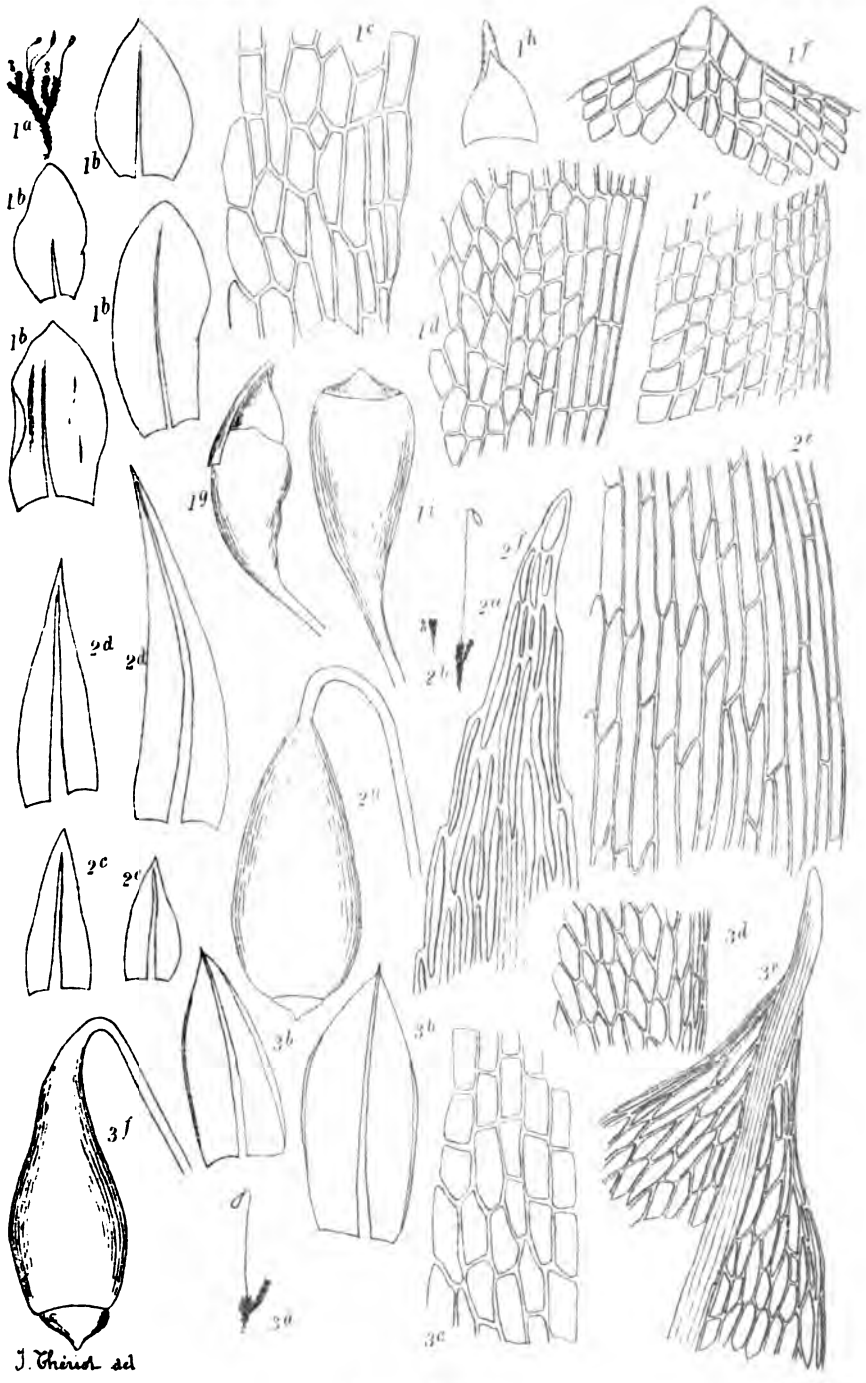

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PLATE XIX.

FIGS. 1, *a–f.* ***Bryum ateleostomum.***

1, *a.* Entire plant, natural size.
1, *b*, *b.* Leaves (× 13).
1, *c.* Apex of a leaf (× 60).
1, *d.* Basal areolation of the same (× 135).
1, *e.* Marginal areolation, in the middle (× 135).
1, *f.* Capsule ripe, in dry state (× 13).

2, *a–g.* ***Bryum heterogynum.***

2, *a.* Female plant, natural size.
2, *b.* Male plant, natural size.
2, *c.* Leaf of the female plant (× 13).
2, *d.* Apex of the same (× 60).
2, *e.* Basal areolation (× 135).
2, *f.* Cells in the middle (× 135).
2, *g.* Young capsule in dry state (× 13).

3, *a–g.* ***Bryum laurentianum.***

3, *a.* Entire plant, natural size.
3, *b*, *b.* Stem-leaves (× 26).
3, *b'.* Branch-leaf (× 26).
3, *c.* Transverse section of a leaf (× 60).
3, *d.* Transverse section of the costa (× 270).
3, *e.* Basal areolation (× 135).
3, *f.* Marginal areolation in the middle (× 135).
3, *g.* Areolation of the apex (× 135).

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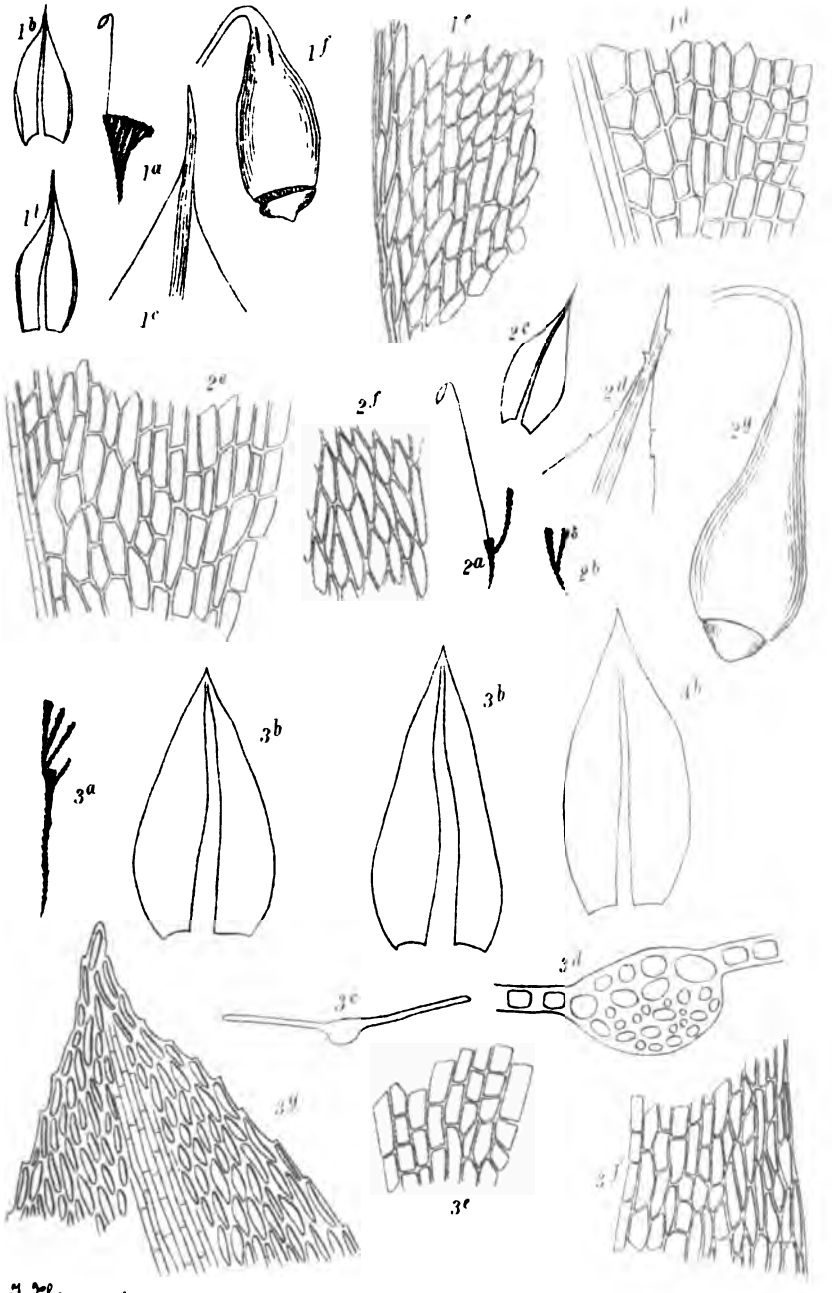

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PLATE XX.

1, *a–g*. *Bryum treleasei.*
1, *a*. Entire plant, natural size.
1, *b*, *b*. Leaves (× 13).
1, *c*, *c*. Transverse section of a leaf (× 135).
1, *d*. Basal areolation of the same (× 135).
1, *e*. Marginal areolation in the lower part (× 135).
1, *f*. Areolation of the apex (× 135).
1, *g*. Young capsule, in moist state (× 13).
2, *a–k*. *Bryum agattuense.*
1, *a*. Entire plant, natural size.
1, *b*, *b*. Stem-leaves (× 13).
2, *c*. Branch-leaf (× 13).
2, *d*. Basal areolation (× 135).
2, *e*. Areolation in the middle (× 135).
2, *f*. Areolation of the apex (× 135).
2, *g*. Capsule unripe, in dry state (× 13).
2, *k*. Capsule ripe, in moist state (× 13).

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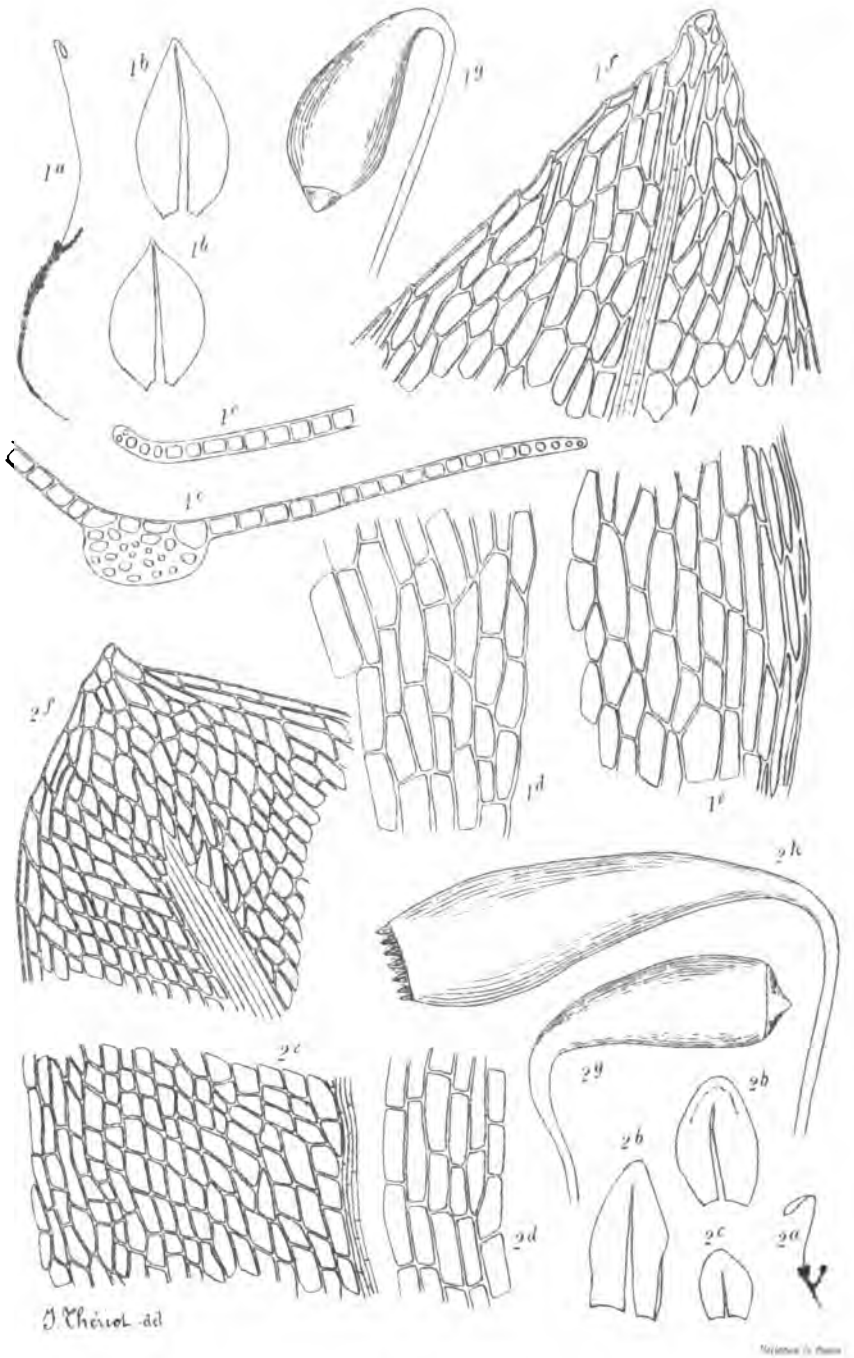

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PLATE XXI.

FIGS. 1, *a–g*. *Bryum harrimani.*

1, *a*. Entire plant, natural size.
1, *b*, *b*. Lower leaves (× 13).
1, *c*, *c*. Upper leaves (× 13).
1, *d*. Basal areolation (× 135).
1, *e*. Marginal areolation, in the middle (× 135).
1, *f*. Apex of a lower leaf (× 135).
1, *g*. Apex of an upper leaf (× 135).

2, *a–l*. *Bartramiopsis lescurii.*

2, *a*, *a*. Entire plant, natural size, in dry state.
2, *b*. The same, in moist state.
2, *c*, *c*. Lower leaves (× 13).
2, *d*, *d*. Upper leaves (× 13).
2, *e*. Cilium of a leaf (× 135).
2, *f*. Apex of a leaf, seen on the ventral side (× 60).
2, *g*. Transverse section of a leaf (× 135).
2, *h*. Basal areolation (× 135).
2, *i*. Cells in the lower part of the leaf (× 270).
2, *j*. Capsule and lid (× 13).
2, *k*. Capsule ripe, in dry state (× 13).
2, *l*. Calyptra (× 13).

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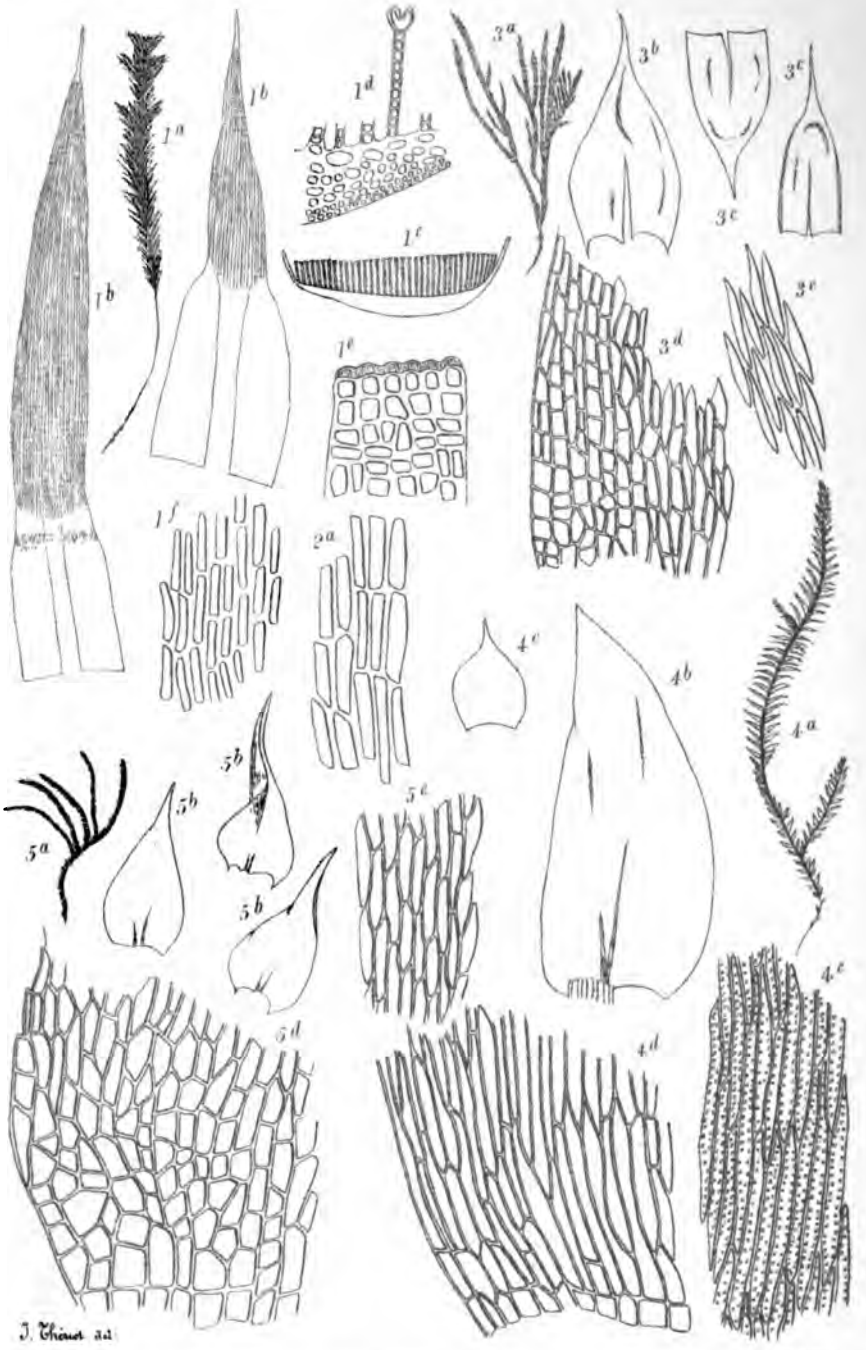

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PLATE XXIII.

FIGS. 1, *a–d*. ***Hypnum pseudostramineum.***
1, *a*, *a*. Leaves (× 18).
1, *b*. Lower part of the costa (× 130).
1, *c*. Areolation in the middle of a leaf (× 225).
1, *d*. Areolation of the apex of a leaf (× 225).
2, *a–h*. ***Hypnum plesiostramineum.***
2, *a*. Entire plant, natural size.
2, *b*, *b*. Lower leaves (× 18).
2, *c*. Lower part of the costa (× 130).
2, *d*. Upper leaf (× 18).
2, *e*. Branch leaf (× 18).
2, *f*. Auricle and basal areolation of a leaf (× 225).
2, *g*. Cells in the middle (× 225).
2, *h*. Areolation of the apex (× 225).
3, *a–e*. ***Meesea tschuctschica.***
3, *a*. Entire plant, natural size.
3, *b*. Part of a stem (× 3).
3, *c*, *c*. Leaves (× 13).
3, *d*. Marginal areolation in the middle (× 135).
3, *e*. Areolation of the apex (× 135).
4, *a–c*. ***Brachythecium reflexum pacificum.***
4, *a*. Stem-leaf (× 13).
4, *b*. Basal areolation (× 135).
4, *c*. Marginal areolation in the middle (× 135).

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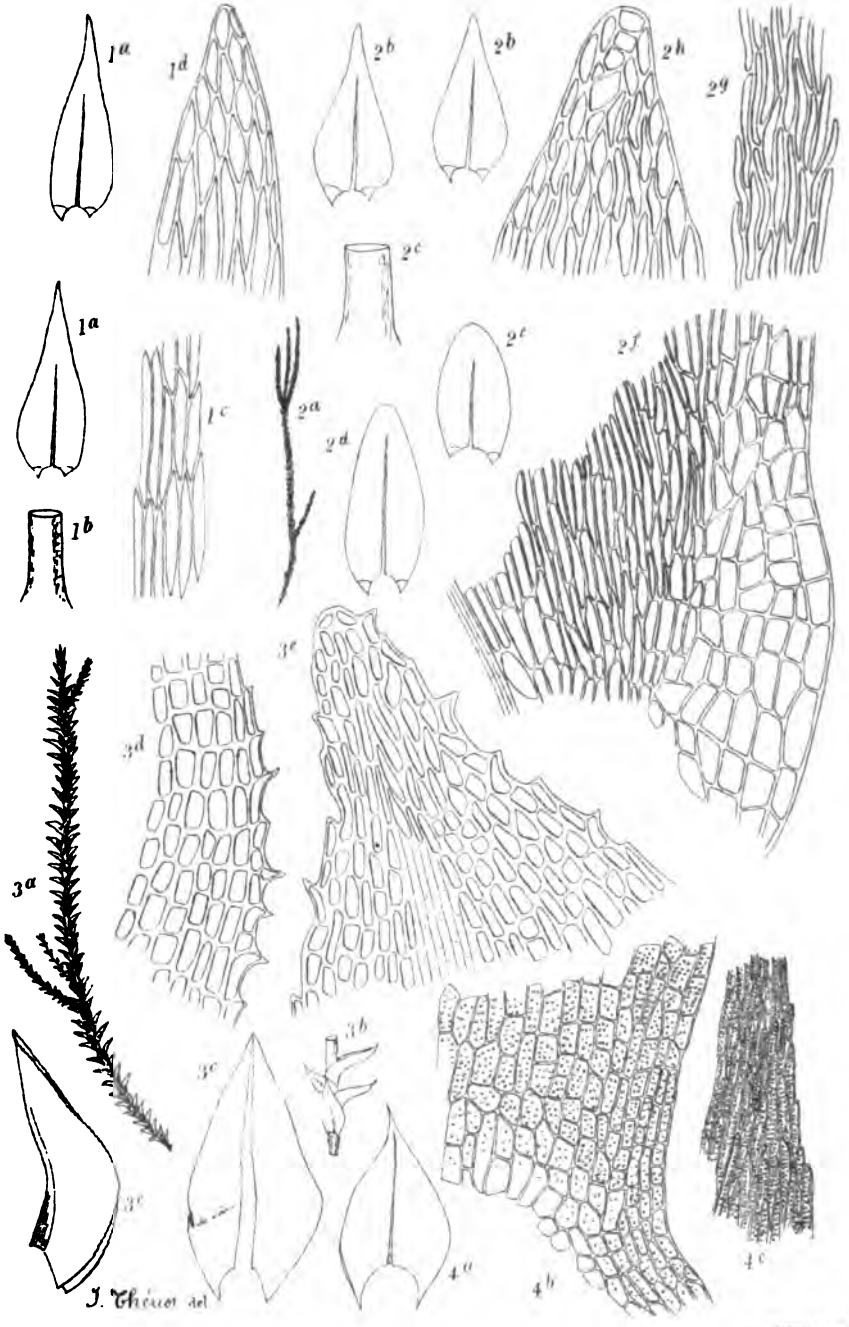

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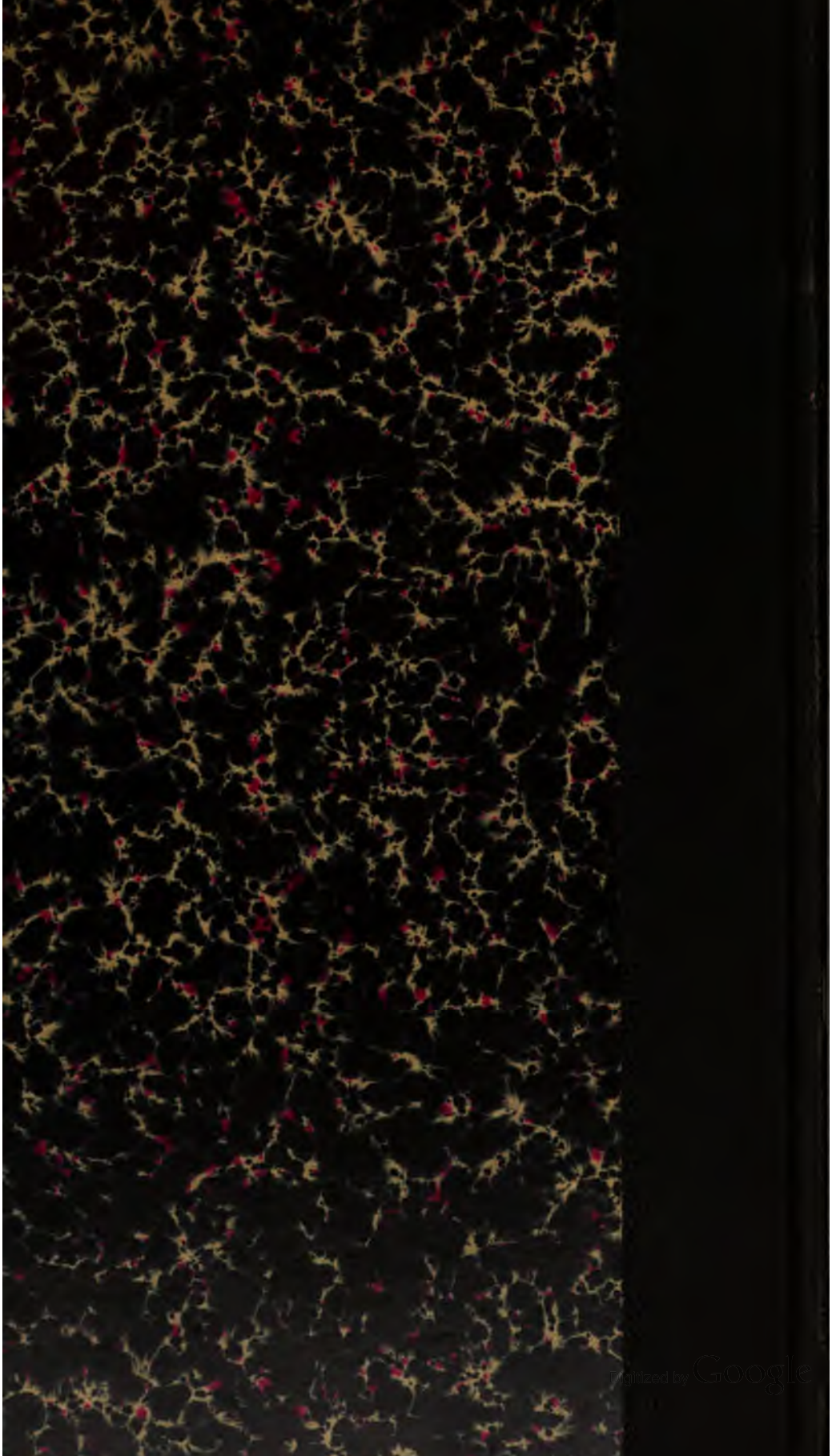
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